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MOORE'S MANUAL OF FAMILY MEDICINE & HYGIENE FOR INDIA

TENTH EDITION

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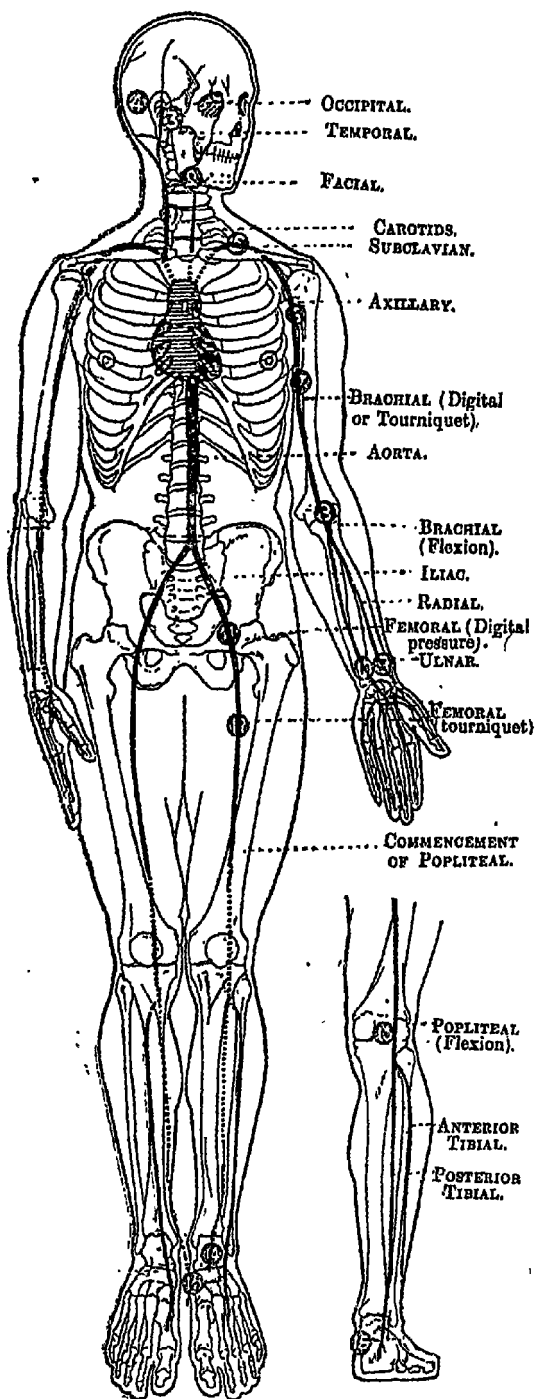
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PREFACE.

THE exhaustion of previous stocks, and the advance of medical knowledge, both necessitate a new edition of this book. The editors have had the advantage of help from many sources in bringing the matter up to date, and they acknowledge with thanks the aid they have received from the following in their appropriate and special subjects :

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C. A. S.

R. D. A.

SIMLA, 1935.

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It should be clearly understood that the treatment of illness recommended in this book, whether by medicine or otherwise, is not intended to take the place of skilled medical assistance and advice. There may be special reasons in any particular case why other measures should be adopted than those here recommended.

What is given here is as a substitute when skilled aid is not obtainable.

CHAPTER I

MEDICINES IN INDIA

Now that druggist's shops and medical halls are so common throughout India even in comparatively small towns, it is better to rely upon one of these and obtain one's drugs fresh than to keep by one a supply of rarely needed medicines that the climate will cause to deteriorate. Even so a few necessities, such as materials for a simple surgical dressing, some carbolic acid, tincture of iodine, potassium permanganate, and quinine sulphate, should be kept in every house, since such are most frequently required.

For those, however, who spend long periods in camp, far removed from medical aid or from druggist's shop, or for those who travel in altogether uncivilised places, something more is necessary. The traveller in the wilds cannot do better than possess one of Messrs. Burroughs and Wellcome's numerous Tabloid Medicine Chests. This firm makes these equipments in many sizes and forms, and the traveller should select one of size and contents according to his probable needs. Whatever else it contains the chest should include some compressed bandages, lints and wools for surgical dressings; carbolic acid to make an antiseptic lotion; magnesium sulphate, and tincture of opium; tincture of iodine, potassium permanganate, quinine sulphate, and aspirin. The last three may be in tablet form. For further detail regarding simple surgical equipment the first pages of Chapter VIII should be consulted. For an aperient pill, the compound colocynth pill given in prescription No. 62 should be taken. Eno's fruit salts is also a valuable mild purgative. Measures for liquids and solids are also necessary.

As some of the drugs given in our Prescriptions at the end of the book can be obtained in Indian and other bazaars, we

give here a list of some of them with their classical and Hindustani names.

Classical name	English name	Hindustani
<i>Abrus precatorius</i>	Jequirity	Gumchi.
<i>Acacia catechu</i>	Catechu	Kathū
<i>Aconitum Ferox</i>	Indian aconito	Bish
<i>Aconitum heterophyllum</i>	Indian atees	Atees
<i>Aconitum napellus</i>	Aconito	Mitha zahār
<i>Aegle maamelos</i>	Bael fruit	Bel
<i>Aloe barbadensis</i>	Barbados aloes	Chikanvār
<i>Alumen</i>	Alum	Phitkari
<i>Andrographis paniculata</i>	Creast	Kiryāt
<i>Andropogon citratis</i>	Lemon grass	Harichāha
<i>Areca catechu</i>	Areca nut	Supari
<i>Balsamodendron myrrha</i>	Myrrh	Bol
<i>Camphora officinarum</i>	Camphor	Kapūr
<i>Cannabis sativa</i>	Indian hemp	Ganja
<i>Capsicum annum</i>	Cayenne pepper	Lal mirch
<i>Cassia lanceolata</i>	Indian senna	Sana
<i>Cera alba v. flava</i>	Wax	Mom
<i>Cinchona cortex</i>	Cinchona bark	Cinchona.
<i>Cinnamomum zeylanicum</i>	Cinnamon	Dālehin
<i>Citrullus colocynthus</i>	Colocynth	Indrāyan
<i>Coffea arabica</i>	Coffee	Kāfi
<i>Coriandrum sativum</i>	Coriander	Dhania
<i>Croton tiglium</i>	Croton-oil seed	Jamālgota
<i>Cubeba officinalis</i>	Cubebs	Kabūbchini
<i>Cuprum</i>	Copper	Tāmbū
<i>Curcuma angustifolia</i>	Indian arrowroot	Takkur
<i>Datura alba</i>	Datura	Dhatoora
<i>Dipterocarpus turbinatus</i>	Gurjun oil	Garjan
<i>Elletaria cardamomum</i>	Cardamom	Elaichi
<i>Eucalyptus globulus</i>	Blue gum	
<i>Eugenia jambolana</i>	Jambul	Jaman
<i>Ferri sulphatis</i>	Sulphate of iron	Hirarkasis
<i>Ferula asafetida</i>	Asafetida	Hing
<i>Glycyrrhiza glabra</i>	Liquorice	Mulhatti
<i>Gynocardia odorata</i>	Chaulmugra	Chaulmugra
<i>Hemidesmus Indicus</i>	Indian sarsaparilla	Magrabu
<i>Hydrargyrum</i>	Mercury	Pārā
<i>Hyoscyamus niger</i>	Henbane	Khorasani ajowan
<i>Juniperus communis</i>	Juniper	Aanar
<i>Linum usitatissimum</i>	Linseed	Alsi
<i>Mel</i>	Honey	Madh
<i>Melia azadirachta</i>	Neem	Nim
<i>Opium</i>	Opium	Afim
<i>Piper nigrum</i>	Black pepper	Kali mirch

Classical name	English name	Hindustani
<i>Plantago ispagula</i>	Isapghul	Isapghūl
<i>Potassii nitras</i>	Saltpetre	Shōrā
<i>Psoralea corylifolia</i>	Babchi	Babchi
<i>Ptychotis ajowan</i>	Ajowan	Ajowan
<i>Ricinus communis</i>	Castor oil	Arand
<i>Santalum album</i>	Sandal-wood	Sandal
<i>Scilla Indica</i>	Indian squill	Jangli pyās
<i>Sodii biboras</i>	Borax	Tinkāl
<i>Sodii chloridum</i>	Common salt	Nimak
<i>Strychnos nux vomica</i>	Nux vomica or strychnine	Kuchlā
Sulphur	Sulphur	Gundhak
<i>Swertia chirata</i>	Chiretta	Chirāyata
<i>Tamarindus Indica</i>	Tamarind	Imli
<i>Zingiber officinalis</i>	Ginger	Adrakh

All ordinary medicines should be obtained at a reputable druggist's ; such simple remedies, however, as alum, asafetida, bael, castor oil, saltpetre, senna leaves, stramonium leaves, honey, and sulphur may be obtained when necessary from the Indian druggist in the village bazaar. There are, however, many other drugs in his stock, powerful in their effects, and most of them well known to European medicine ; but the source and strength of these is so variable that it is scarcely advisable to make use of them except in cases of extreme emergency, and the writer has seen cases of accident and even of death produced from their indiscriminate use by hakims and other self-constituted physicians. Even some of the drugs that are pure may vary in strength, owing to the drugs having been procured not from one but from many allied species of plants. Until the day therefore when standardised preparations of Indian drugs can be obtained, it will be better to avoid the medicines obtained from the bunniah, except in the case of the simple remedies above mentioned.

COMPOUNDING OF MEDICINES

Weights and Measures used in Compounding Medicines

WEIGHT FOR SOLIDS

20 grains make	.	.	.	.	.	1 scruple
3 scruples	„	.	.	.	.	1 drachm
8 drachms	„	.	.	.	.	1 ounce
12 ounces	„	.	.	.	.	1 pound

MEASURES FOR FLUIDS

60 minims make	.	.	.	.	.	1 drachm
8 drachms	„	.	.	.	.	1 ounce
20 ounces	„	.	.	.	.	1 pint
8 pints	„	.	.	.	.	1 gallon

Glass measures as sketched below should be placed in all medicine chests large enough to admit them :

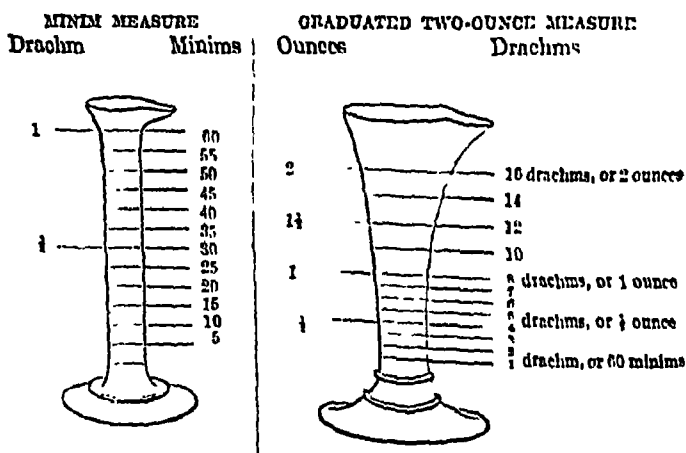


FIG. 1.

When the quantity of fluid medicine is so small that it cannot be measured by *minims*, *drops* are ordered, which should

be poured from the bottle accurately. The bottle should be held obliquely, with the lower part of the lip resting against the stopper. The bottle should then be carefully tilted, when the contents will drop from the lower edge of the stopper. A little practice will enable any person to drop with exactness.

It should be remembered that drops do not necessarily equal *minims*, as fluids vary in density; for instance, oil and water. The size of the mouth of the bottle, and the manner in which the fluid is manipulated, may also vary the size of the drop. The best plan is, therefore, to obtain a *glass medicine dropper*, by which greater accuracy is insured. Measurement of fluids by the minim glass should, however, always be adopted, unless the medicine is required in very small quantities.

The following is a rough measurement of fluids approximating to the apothecaries' measure for fluids (*see* p. 4). This rough measurement is sufficiently accurate for doses of ordinary mixtures, the active ingredients in which are diluted by water; but it should *not* be used to compound medicines, or to measure them in the *undiluted condition*, as the size of spoons, even of the same class, is liable to vary.

1 teaspoonful	= one drachm
1 desertspoonful	= two drachms
1 tablespoonful	= four drachms, or half an ounce
1 small wineglassful	= about two ounces
1 Breakfast cupful	= about eight ounces

In COMPOUNDING MEDICINES distilled water should be used. If this cannot be procured, water which has been purified by filtering and boiling should be used, and the measurer, knives, etc., should be kept perfectly clean.

DOSES OF MEDICINES

Unless expressly stated to the contrary, the doses mentioned in the account of diseases, and in the collection of prescriptions (*see* Chapter XXIII), are those adopted for an

ordinary strong adult. For younger and less robust patients, and for children, a smaller dose is necessary. Delicate women usually require a less powerful agent than stronger women, or than, those of the other sex.

The following table shows the approximate doses of medicines for different ages. For solids the scales and weights must be used, according to apothecaries' weight (*see* p. 4). For fluids the measures must be used (*see* p. 4), and *minims* must be substituted for grains, according to apothecaries' measure (*see* p. 4). Below five minims drops should be given (*see* p. 5).

Age above	Maximum dose one ounce	Maximum dose one drachm	Maximum dose one scruple
1 month	24 grains	3 grains	1 grain
6 months	2 scruples	5 grains	1½ grains
1 year	1 drachm	8 grains	2½ grains
2 years	1½ drachm	9 grains	3 grains
3 "	1½ drachm	12 grains	4 grains
5 "	2 drachms	15 grains	5 grains
7 "	3 drachms	20 grains	7 grains
10 "	½ ounce	½ drachm	½ scruple
12 "	5 drachms	40 grains	14 grains
15 "	6 drachms	45 grains	16 grains
20 "	7 drachms	50 grains	18 grains
21 "	1 ounce	1 drachm	1 scruple

This shows that, if the dose of any medicine for a man of twenty-one years of age is 1 ounce (maximum dose), then the dose of the same medicine for a child between one month and six months is 24 grains, or 24 minims if a fluid; for a child above five years of age, 2 drachms; and for a child above ten,

half an ounce. Or, if 1 scruple, or of fluid 20 minims, is the maximum dose for a full-grown man, then the dose of the same medicine for a child seven years old will be 7 grains of a solid medicine, and 7 drops of a fluid medicine ; and for a child one month old 1 grain, or 1 drop.

The above may be accepted as safe for ordinarily strong children ; but when dealing with weakly children it will be advisable to lessen the quantities by one-sixth up to one year of age, and by one-eighth from one year to ten years of age.

Independent of the differences which exist between the doses suited to an adult male and a delicate female, as mentioned above, other circumstances, such as *habit, disease, climate, mind, race, and idiosyncrasy*, must often be considered when regulating the dose. Thus children are peculiarly susceptible to the influence of *opium*, very minute quantities having proved fatal to infants ; and unfortunately opium is the powerful agent in various 'soothing syrups' and 'cordials' sold for children. In this book preparations containing opium are rarely, and always most cautiously, prescribed for children. Habit will enable certain people to consume large quantities of opium, arsenic, and of some other substances : in certain maladies large doses of opium produce little effect. In a tropical climate it is sometimes undesirable to use purgatives with the freedom with which they may be given in other latitudes ; and especially so if cholera prevails.

Idiosyncrasy to Drugs

Indians as a rule require smaller doses than Europeans, except in the case of purgatives, of which they require larger doses. Besides such differences due to race, climate, or age, there are found at times certain individual peculiarities to certain drugs ; this is called an idiosyncrasy. Such idiosyncrasy is illustrated by the smallest particle of mercury sometimes producing salivation, by iodide of potassium occasionally exciting symptoms of *coryza*, and by pollen exciting hay asthma in some people. It is not, however, medicines only which produce extraordinary effects on peculiar constitutions. There are persons who cannot eat celery, shellfish, oatmeal cakes, strawberries, apples, mushrooms, or cucumber without suffering from nettlerash or colic.

These peculiarities, however, are very much the exception : although certain neurotic people are inclined to imagine they possess them when they really do not. This is not infrequently the case when the medicine suggested is unpleasant in taste or in immediate effect.

CHAPTER II

THE ANATOMY AND PHYSIOLOGY OF THE HUMAN BODY

IN the work now to be undertaken, it is essential that the reader should be acquainted not only with the remedies at his disposal and the diseases he is liable to meet with, but also with the methods by which he may distinguish one disease from another. It is necessary therefore that the lay reader should have some preliminary knowledge of the size, shape, position, and function of the various organs in the human body in order that he may be able to ascertain the particular organ or organs affected, from the symptoms complained of by the patient. Such a knowledge implies a preliminary study of the anatomy (or formation) and the physiology (or function) of the various parts of the human body, and a chapter on these subjects would therefore seem to form an essential portion of this work.

The human body is roughly separable into head, trunk, and limbs. If the body were split lengthwise with a great knife, which was made to pass down the middle line of both front and back aspects, the two halves would be seen to be almost exactly alike. One-half of the body divided in this way would show in the trunk the cut surfaces of thirty-three bones joined together by a very strong and tough substance into a long vertical column, which lies much nearer the back (or posterior) aspect of the body than to the front or anterior aspect. The bones thus cut through are called the *vertebræ*. They enclose a long slender canal, called the spinal canal, which lies near the back aspect of the body, behind the more spacious chamber of the chest and abdomen which lies in front. There is no direct communication between these two primary canals of the body. The spinal canal contains a long white cord (the spinal cord), which is a very important part of the nervous system. The anterior chamber is divided transversely by a partition, partly fleshy, partly membranous, called the diaphragm, into two subsidiary chambers, the chest or thorax, and the belly or

abdomen. The alimentary canal or tube by which the food is conveyed into the body traverses both these chambers passing

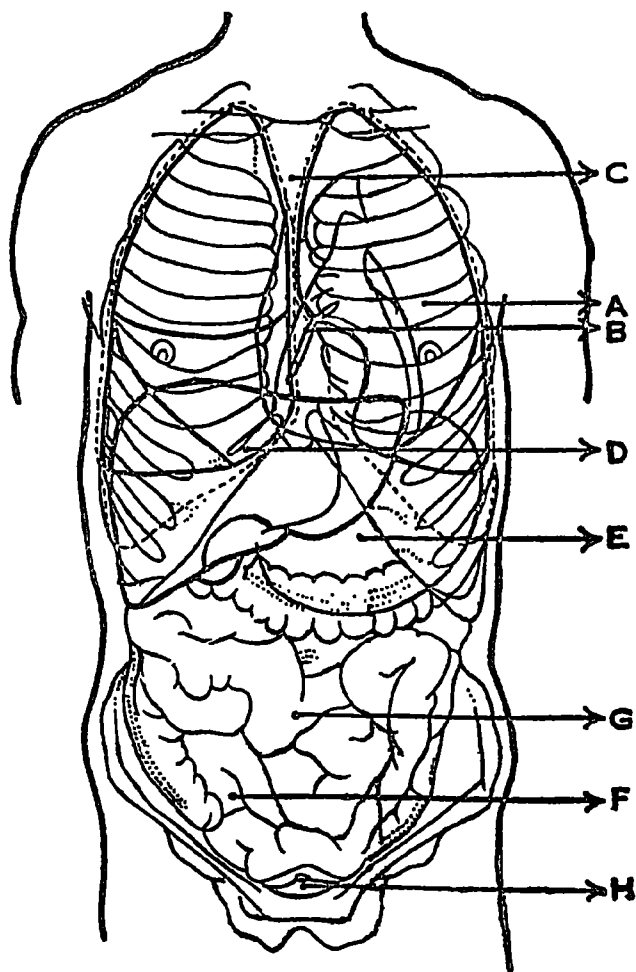


FIG. 2. Front.

A—Lung.

B—Heart.

C—Sternum or Breast bone.

D—Liver.

E—Stomach.

F—Small intestine.

G—Colon or large intestine.

H—Bladder.

From Hutchison and Rainey's Chemical Method. By kind permission.

through the diaphragm. So does a long double chain of little masses of nerve substance, called the ganglia, which are

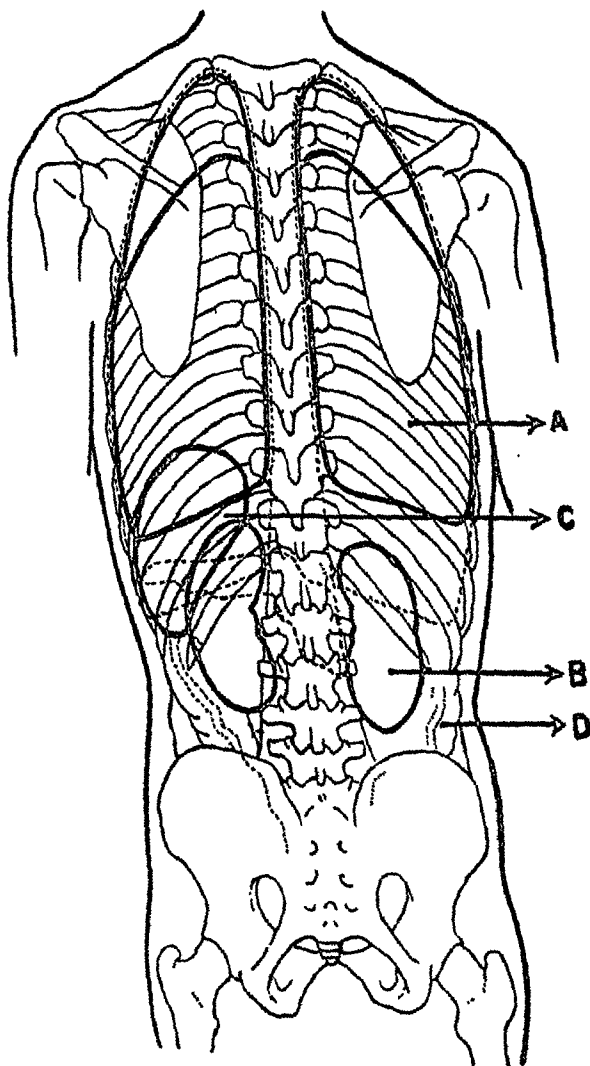


FIG. 3. Back.

A—Lung.

C—Spleen.

B—Kidney.

D—Colon or large intestine.

connected together by nerve cords. These constitute what is known as the sympathetic nervous system. In addition to alimentary canal and sympathetic nerves, the abdomen

contains two kidneys, one placed against each side of the vertebral column, a liver, pancreas or sweetbread, spleen, and bladder, and in the female a womb and two ovaries. The thorax or chest, besides its segment of alimentary canal and sympathetic nerves, contains the heart and two lungs. These last are placed one on each side of the heart, which lies nearly in the middle of the chest.

Where the head joins the body the uppermost of the thirty-three vertebrae is succeeded by a continuous mass of bone which extends through the head and still separates a posterior from an anterior chamber. The posterior and upper chamber, or cavity of the skull opens into the spinal canal. It contains a large mass of nerve matter called the brain, which is continuous with the spinal cord, the two together constituting the cerebro-spinal axis. The ventral chamber or face is occupied almost entirely by the mouth and pharynx, which form the upper end of the alimentary canal.

We see thus from a study of the human body that it is essentially composed of two tubes, a dorsal one and a ventral, separated completely from one another by the bony spinal column and the bony skull axis, which form the floor of one tube and the roof of the other. If viewed on transverse section, it is seen that these tubes differ in their comparative size according to the position at which the transverse sections is made, the posterior being much the larger at its upper end, where it contains the brain; while in the region of the thorax and abdomen it is the anterior one, which contains lung and heart, or stomach, liver, kidneys, spleen, etc., that has the preponderance in capacity.

Such chambers as are found in the trunk are nowhere to be met with in the limbs. These are solid or semi-solid throughout except for the tubes (blood-vessels and lymphatic vessels) which permeate them, conveying nourishment to their structures and carrying off the waste products evolved by their action.

On dissection of the human body with no other apparatus than the surgeon's knife we can see that it is covered by a continuous membrane, thicker at some parts, thinner at others, called the skin; and if we trace this membrane to the various apertures of the body we will find that it continues inside the body and forms a lining to the various cavities. Its character, it is true, differs as it passes inside, but the lining membrane of the cavities is continuous with the skin of the exterior.

By careful dissection it will be seen that this membrane is everywhere composed of two layers ; an outer one, purely membranous, containing no blood-vessels or nerves ; and an inner one containing both, but mainly fibrous in its structure, from the deep surface of which fibres radiate in all directions into the organs contained in the body in such a complete network, that if the structure of the various organs could be washed away a fibrous cast would be left of the entire body. The outer membranous layer, where it covers the exterior of the body, is called the epidermis. It is there stratified, and it is to the comparative number of its strata that the thickness or thinness of the outer skin at the various parts is due. Where it lines the cavities of the body it becomes unstratified, hence thinner and redder, and takes on the function of secreting mucus, a glairy fluid which lubricates the interior of the various cavities of the body. It is then distinguished by the name of mucous membrane or epithelium, but is essentially a continuous membrane lining the interior of the cavities, as the skin does the exterior of all, and it is continuous at its margins with that membrane. The derma or true skin and the deep layer of the mucous membrane which corresponds to it, are, as already stated, chiefly made up of fibrous filaments which spread from these throughout the body in all directions. These fibres collectively are known as the connective tissues of the body, because it is by means of them that the whole body is knit together. Connective tissue varies very much in character ; in some places it is soft and filamentous, as where it forms the framework of soft organs like the spleen or liver, at others it is collected together into firm cords and bands, as in the tendons and ligaments, and attains great strength and density ; but it exists everywhere throughout the body, and forms a sheath to each organ as well as a fine meshwork in the inside of the organs, upon which as in a framework the various organs are built up.

The presence and action of some of these organs which are built up in this meshwork of connective tissue may be determined during life. Thus if the front of the upper arm of a man whose arm is extended be grasped by another person, a soft mass will be felt, which thickens and becomes hard if the forearm is bent on the arm. When the forearm is extended, the upper arm again becomes soft, and the thickening and hardness vanish. If the skin were removed from the front of the upper arm, it would be found that this thickening and hardness

was due to the presence of a mass of red flesh enveloped in connective tissue. If this envelope of connective tissue were examined, it would be found to be collected into a cord or tendon at either end attached at the upper extremity to the shoulder blade and at the lower to the bones of the forearm, and that the thickening and hardening of the flesh was due to an inherent property residing in the flesh, whereby it could change its dimensions, becoming shorter and thicker under the influence of will, and returning to its original dimensions when left alone. By the thickening and shortening of the muscle or flesh, the bony points to which the tendons at either end are attached are naturally approximated and the forearm is thus bent on the arm. This temporary thickening and shortening, which is the inherent property of all muscular tissue, is termed its contractility, and it is through this property that muscular tissue becomes the great motor agent of the body, the muscles being so disposed between the bones which constitute the system of levers that support the body that their contraction necessitates the movement of one lever upon another. These levers form part of the system of hard tissues which constitute the skeleton. The less hard of these are the cartilages, composed of a dense firm substance commonly known as gristle. Harder than this are the bones, masses of tissue akin to cartilage, but naturally petrified by being impregnated with phosphate and carbonate of lime. All the bones of the body are fastened together by ligamentous bands of connective tissue, passing from one to the other, and where the end of one plays on the end of another they are capped with a smooth coating of cartilage in order to prevent jarring and to reduce friction. The opposite surfaces of cartilage, which thus form part of every joint, are called the articular cartilages, and every joint is lined with a delicate membrane which secretes a little joint-oil to lubricate the ends of the bones as they rub one upon the other.

More than two hundred bones are described as constituting the bony skeleton, but the number varies with the time of life, some of these separate bones becoming welded together as age advances. Thus there are in early adult life thirty-three separate bones in the spinal column, and although the upper twenty-four ordinarily remain distinct throughout life, the 25th, 26th, 27th, 28th, and 29th ordinarily become later on united into a separate bony mass called the sacrum, while the 30th, 31st, 32nd and 33rd also frequently run together into

another mass, known as the coccyx. The pelvis, to which the legs are attached, consists, in the adult, of two large bones (the ossa innominata), but in early life each of these consists of three—the ilium, the ischium, and the os pubis. If we place a joined skeleton or a dead body on its feet on the ground, we will find that in no position is it possible to make it stand upright; the centre of gravity is too high, and the play of the joints one with the other is too free. The upright position, easy as it may seem, is the result of the balance of a number of muscles one with another. The foot forms the surface of support, but it is only by the pull of the muscles on the back of the leg that this is kept upright; the pull of the muscles on the back of the leg would bend the thigh backwards were it not for the strong counterbalancing pull of the muscles on the front of the thigh. These are similarly counterbalanced by the muscles of the hip, and so on; it is only by a series of balancing and counterbalancing movements all over the body that the erect posture is maintained at all. What is it then that adjusts the force of all these movements and enables us to assume and to maintain the erect posture which we seem to take up so quickly and easily? If a person, while standing in the erect posture, receives a violent blow on the head, he will, if the blow be severe enough, lose consciousness and drop helpless all of a heap on the ground. A violent emotion will in some persons produce the same effect. The blow need not be severe enough to cause permanent injury; in a few minutes the person may recover, and be able to rise and to stand erect again, but for the time being an influence has been exerted on something which governs the muscles, and this has been accompanied by unconsciousness of shorter or longer duration. A cursory examination of this phenomenon might lead us to the conclusion that it is the mind which governs the muscles, but persons who have been so shot or stabbed, or otherwise injured in the back as to sever their spinal cords, without any considerable injury to other parts, have been found also to lose the power of standing up, although their minds have remained clear. Under these circumstances, they are unable not only to stand, but also to feel anything that is going on in the lower parts of their bodies, or to make any movement in them. Although the mind is thus cut off from the lower limbs, a controlling or governing power, however, may still remain, for if the soles of the feet be tickled, the legs are drawn up on the body, and an electric current passed through the limbs will

cause them to contract even more vigorously than if the spinal cord were uninjured. If, however, the injury received has been so severe as not only to cut or sever the spinal cord but to crush it or disorganise it, then neither tickling of the soles nor electric currents however powerful will cause the limbs to be drawn up. The conclusion to be drawn from this is that while the brain is the seat of all sensations and of mental action in general, and the primary source of all voluntary muscular motions, yet the spinal cord is by itself capable of receiving an impression from the exterior, and of converting it not only into a simple muscular contraction, but even into a combination of such. Some of the impressions that the body is capable of receiving from without are very diverse in character and appeal only to very limited parts of the body, while others are perceptible by the whole body. Thus an impression of touch, of heat, or of cold may be received by any part of the skin, but an impression of taste, smell, hearing, or vision can be received by only a small portion of the body which has been specialised to receive such an impression. These portions of the body which have been so specialised are termed the organs of special sense, and of these there are four—the eyes or organs of vision, the ears or organs of hearing, the nose the organ of smell, and the tongue and parts of the pharynx, the organ of taste.

We have now described briefly the gross structure of the body and before passing on to consider the working of this wonderful machine, a few words as to the minute or microscopical structure of the body might be appropriate. All living matter has, as its ultimate functional unit, a structure called a "Cell". This may be regarded as a little individual in the large society which we recognise as a body. It will be seen therefore that a body is really an aggregate of these small individuals or cells, each having its particular function to perform for the welfare of the whole. Cells are of various shapes and consist essentially of a membrane enclosing a viscous substance known as Cytoplasm within which there lies the small body, that is usually of a circular shape and is known as the nucleus. This nucleus controls the life process going on within the cell. In order that the cell may live to do its appropriate work, food has to be brought to it in a simple and easily assimilable form, and waste products produced in the course of its work have to be removed. Then again the life of the majority of the body cells is shorter than that of the body, so

they have a function of division, one cell becoming two by singularly beautiful process known as "mitosis". If this were not so, any simple injury would never heal. Each tissue has its usual form of cell adapted for its particular work. For instance a kidney cell has to excrete certain substances presented to it by the blood, and a nerve cell has to conduct impulses from the brain and from the spinal cord.

All work implies waste. The work of the nervous system and that of the muscles therefore implies consumption, either of their own substance or of something else. The human machine, like others, can do no work without fuel, and it must have a means of throwing out the waste. This is, broadly, what it does. By means of the alimentary organs fuel is brought in, and converted into a condition fit for the use of the body that is into simple substances fit for cell consumption; by the circulation the alimentary materials are carried to the parts of the body that required them; while the excretory organs get rid of waste products. The alimentary organs are the mouth, pharynx, gullet, stomach, and intestines, with their appendages. Food-stuffs are received in the mouth and thence pass through the alimentary canal, the whole purpose of whose action is to separate the nutritious portions from the non-nutritious residue, and to reduce the foods into a state of solution or of very fine subdivision in order that they may pass through its walls into the minute branches of the vascular system, which forms a meshwork of vessels around the intestines.

First of all, the teeth crush the food and reduce it to small particles, which are capable of being easily mixed with the fluids secreted in the alimentary canal or its appendages. Thus it comes into contact in the mouth with the fluid secreted by the salivary glands. This fluid not only moistens the food and makes it more easily swallowed, but a chemical is found in it, formed by these glands, which has the effect of changing the insoluble starchy substances of the food into an easily soluble sugar. The action to which the food is next submitted in the stomach is also a solvent one, converting some insoluble substances into solutions which easily pass through an animal membrane. This is accomplished by the glands of the stomach. These glands line the whole of the interior of the stomach, which in a state of rest is pale and slightly moist. When food is taken the stomach is stimulated in such a way that its interior blushes and its glands secrete a

watery fluid, which by the involuntary movements of the stomach mixes thoroughly with the food. The watery fluid contains another ferment, which has the power of converting insoluble albuminous substances, like white of egg, into a soluble substance called peptone. The food now passes into the intestine, and there it meets with the fluid secreted by two of the most important appendages to the alimentary canal, *viz.*, the liver and the pancreas or sweetbread. The fluid secreted by these is thoroughly mixed with the food as it is passed through the upper part of the small intestine by the involuntary movements of that portion of the gut, and further changes occur in the food. The pancreatic juice converts the remainder of the starchy material in the food, which has not already been converted into sugar by the saliva, into a soluble sugar; more of the albumins are converted into simple products called amino-acids, while the bile and the pancreatic juice together act on the fats in the food and emulsify them, *i.e.*, break them up into exceedingly minute particles. The fats of the food are thus rendered easily absorbable by the lacteals, a series of little vessels lying in the walls of the intestine along with the blood-vessels, which have the special function of carrying the fats absorbed to a special channel—the lymphatic duct—into the blood-stream. Amino-acids and sugars are carried into the blood-stream *via* the liver, where they undergo some change. As the food passes along the small intestine, digestion and absorption go on simultaneously. All the way down, the proteins, starches and fats of a meal are undergoing digestion and passing away by the lacteals or the blood-vessels, so that by the time the food has reached the large intestine a great deal of the nutritious matter has been absorbed. Even in the large intestine some nutritious matter is still absorbed, but one marked change undergone in this part of the alimentary canal is the absorption of water. Up to the large intestine, the amount of fluid secreted into the bowel is about equal to the amount absorbed; in the large intestine, on the contrary, the contents become less and less fluid. At the same time a characteristic odour and colour are developed, and the remains of the food, now consisting either of indigestible matter or of matter which has escaped the action of the digestive juices, gradually assumes the character of *feces*.

We have seen that there are a series of vessels which carry away the digested products of the food from the alimentary

system. These are very minute tubes with very thin walls, which are called capillaries. Such tubes, with function varying at the different parts of the body, are found throughout. On all sides these capillaries pass into larger tubes called arteries and veins, and these becoming larger and larger at length open into the heart, an organ placed, as we have seen, near the middle of the thorax or chest. The walls of the heart are muscular, and it contracts rhythmically at regular intervals, forcing by these contractions the blood which its cavities contain into the arteries, whence the blood passes to the capillaries and so through the veins back into the heart again. Thus the circulation of the blood is carried on, and the nourishment which it contains is brought into contact with every part of the body. Not only, however, is nourishment conveyed to the tissues through the blood. All energy implies waste, and waste products must be removed. It is the fresh blood-stream sweeping *via* the arteries through the capillaries that gathers up all the waste substances, the products of tissue activity, and carries these into the excretory organs to be separated and removed from the body.

Waste products occur in numerous different forms in the body, but are mostly finally resolved into three principal ones before removal, *viz.*, carbonic acid, water, and urea; and the excretory organs are mainly concerned in varying degrees with the removal of these three. However much the excretory organs may differ in appearance, they are all constructed upon one and the same principle. Each ultimately consists of a fine animal membrane analogous to a sheet of blotting-paper, one side of which is in communication with the exterior, while the other is in contact with a stream of blood that has to be purified. These sheets of blotting-paper may be folded up and crinkled into various shapes, which determine the various shapes of the different organs, but the principle is always the same although the different sheets of blotting-paper have the power to strain out the different waste products from the system.

Each of the excretory organs is mainly concerned with one of the chief waste products, although it may at the same time offer an auxiliary means for the escape of some one or other of the rest. Thus the lungs are specially constructed to get rid of the carbonic acid, but at the same time they get rid of a good deal of watery vapour. The chief duty of the kidneys is to get rid of urea and saline matter, but at the same time they pass off a good deal of water and some carbonic acid.

The skin is chiefly concerned with the getting rid of water, but some carbonic acid and urea also is excreted by it.

The lungs have a double role to play in the animal economy, for not only do they eliminate the carbonic acid but they also serve to bring to the tissues oxygen, a substance which is as important as food or drink, since in defect of oxygen the nutritive matters in the food cannot be oxygenated. In other words, the fuel conveyed to the human machine cannot be burnt up and made to yield its supply of energy or heat.

We have thus briefly described the alimentary, the circulatory, and the excretory systems of the human body, and seen how each does its work. This work must, however, be carried on in just harmony. Not only must the quantity of aliment taken in be at least equivalent to the waste, but it must be distributed with due rapidity in relation to the comparative waste in each locality, and the temperature of the body must be maintained at a tolerably even figure in spite of the constant variations in the temperature of the air.

A combining system must, in fact, be added to the organs already described, and this is to be found in the nervous system, which not only possesses the function, already described, of enabling us to move our bodies and become aware of what is going on in the external world; but also makes us aware of our need of food, enables us to discriminate nutritious from non-nutritious matter, to exert the muscular actions necessary for seizing food and for guiding it to the mouth, and governs all the movements of the jaws and of the alimentary canal.

By it also the heart is worked and adjusted, and the calibres of the distributing pipes are regulated so that the nervous system governs the excretory and the distribution of blood as well.

There is another series of organs in the body which has come into considerable prominence in the last 20 years. These organs are known as the ductless glands or more correctly the "Endocrines". These are glands in various parts of the body, which elaborate complicated chemical substances that are carried in the blood stream to distant parts of the body where they bring about various effects. The most important are: the pituitary body, situated in the middle of the brain, the thyroid in the neck, the sex glands and two small bodies just above the kidneys, known as the suprarenal bodies. Their functions are complicated, and in a book of this nature it is only possible

to indicate their general importance to the animal economy. The natural growth of the body from childhood to adult life is controlled by one of many complicated substances elaborated in the pituitary. If too much of this secretion is produced the body growth becomes excessive, resulting in a giant. Examples of this phenomenon are seen occasionally in travelling fairs. The thyroid gland produces a secretion which regulates the intensity with which the body burns up the food presented to it, and deficiency of this substance causes the fires to burn low and the organism to become sluggish. Examples might be multiplied of the indispensable functions of these glands, but sufficient has been said to indicate their position in the economy of the human body.

These various functions constitute the great part of what are known as the vital actions of the body. So long as they are performed, the body is said to possess life. The cessation of these functions constitutes what is ordinarily termed death. In reality there are several kinds of death which may, in the first place, be distinguished from one another under the two categories of local and general death. Local death is going on every moment and in all parts of the body. Individual cells of the epidermis are constantly dying and being cast off to be replaced by others which are as constantly coming into existence. This is equally true of the blood corpuscles and of most of the other elementary cells of the tissues. This form of death is insensible to ourselves, but is necessary for the due maintenance of life. Occasionally, however, local death occurs on a larger scale as a result of disease or injury. Thus a burn may suddenly kill a larger or smaller portion of skin, or part of the subcutaneous tissue may slough out in the core of a boil, or a whole limb even may die as a result of mortification caused by some disease which interferes with the conveyance of nourishment to that part. The local death of some tissues is followed by their regeneration. Not only may epidermis or skin be thus reproduced, but nerve fibres, connective tissue, even bone also may thus form again after the local death of their predecessors.

With regard to general death, the methods in which this is brought about would appear at first sight to be extremely various. A man may die of old age, of disease of the heart, lungs, liver, spleen, or brain by some variety of injury or by poison. In reality, however, the immediate cause of death is always the stoppage of function of one or other of three

systems, *viz.*, the cerebro-spinal nervous system, the lungs, or the heart. In hanging, death is usually produced by injury to the lower part of the brain, the medulla oblongata ; in drowning, by stoppage of the respiratory functions ; in heart failure, by the sudden cessation of the heart-beat and the consequent stoppage of the circulation of the blood. Examining these methods of death still more closely, it will be found on ultimate analysis that general death is always produced in one of two ways, either by stoppage of respiration or of circulation. Death of the body as a whole, then, implies cessation of the functions of the brain, of the circulatory and of the respiratory organs, but this does not imply death of the individual tissues. This does not take place till some time afterwards, and for a short period, after what is ordinarily called death, the tissues, *e.g.*, the muscles, may be made to contract by the application of proper stimuli. In the end, however, after general death has occurred, the tissues too die, and the forces of the inorganic world work their will with the dead tissues. Oxygen, the slave of the living body, becomes the master of the corpse, and atom by atom the more complex molecules of the human frame become broken down into simpler and more oxidised substances, and are dissipated into the atmosphere, chiefly in the form of carbonic acid, ammonia, and water. Even dense earthy structures, like the bones and teeth, are ultimately deprived of their animal basis, and becoming pulverised, dissolve among the waters of the globe, and the whole complete human frame is thus reduced into its simplest component elements, whence it may again be gathered up to form new component parts of some other form of life.

CHAPTER III

THE DIAGNOSIS OF DISEASE

BEFORE you can treat a disease successfully you must make yourself acquainted with its nature and the symptoms it produces. For instance, a person may come to you complaining of a pain in the head. This may be due to various causes, and it is necessary for you to distinguish the cause to which it is due before you can hope successfully to cure the evil. It may be due to a decayed tooth, in which case extraction is the only effectual remedy; it may be caused by neuralgia, in which case a purgative and the subsequent administration of aspirin may be successful in relieving it; or it may be due to an incurable disease of the brain. But in any case it is necessary for you to ascertain the nature of the disease before you proceed with the treatment. This is what is termed the diagnosis of a disease.

Diagnosis is the science which teaches us to distinguish one disease from another and to trace signs of disease to the causes from which they spring; and before studying the method of distinguishing disease of one organ from disease of another, it is necessary for you to be acquainted with the position, size, and healthy structure of each organ, as well as to be able to become cognisant with the various conditions of disease to which they are liable.

Diseases are distinguished from one another either by such alterations in the organs themselves, or their secretions, as can be ascertained by the senses of the observer (signs), or by changes in the functions of the parts affected, which are perceptible only to the patient (symptoms). The signs of a disease are least liable to mislead us, as in regard to them we are independent of the feelings of the patient, which he may be inclined to exaggerate. Of late years much greater care has been exercised with regard to the diagnosis of disease, and many instruments, *e.g.*, the stethoscope, the laryngoscope, and the ophthalmoscope, have been invented which enable us to obtain a more accurate knowledge of the various conditions to be found in diseased organs; but as these instruments

all require a certain amount of professional training to enable them to be used successfully, a description of their use is out of place in a volume like the present, and only methods of diagnosis which require the use of the senses and a certain amount of ordinary intelligence will be discussed.

In every case of disease that you are called upon to treat you should first endeavour to form your diagnosis from a careful examination of the patient's symptoms, and in order that you may miss nothing which may be of importance, it is well to follow a regular plan in so doing and to make a note of your observations. Such notes will often be of the utmost value to the physician who may subsequently have to be called in to attend the case ; and in any case, if you do this systematically, you may be sure that no important fact has been omitted. Commence with the age of your patient. This is important, because many diseases, such as cancer, are more apt to occur at certain periods of life. The nature of his occupation, too, often gives a clue to the complaint ; as, for instance, painters and other workers in lead are specially liable to colic, paralysis, gout, and disease of the kidney.

Note the position of the patient. In pleurisy he usually rests on the affected side ; in many diseases of the heart and lung, he prefers the sitting posture ; while he usually lies flat and helpless in fevers and other diseases attended with great weakness. The general condition of the body must also be noted. He may be emaciated, as in consumption (phthisis), or œdematous and puffy, as in diseases of the heart or of the kidney.

The state of the skin also is of importance. It may be yellow, as in jaundice, dry and harsh, as in some diseases of the kidney, or soft, perspiring, and emitting an acid odour, as in rheumatic fever, or covered with some characteristic rash, as in the various specific fevers. The features and expression of the patient are of the utmost importance ; indeed, each feature may furnish its own particular indications of disease. Thus the dilated nostril points to difficulty of breathing, the angle of the mouth drops in palsy, or is fixed in a rigid smile in tetanus or lock-jaw.

Next inquire into the manner in which the complaint commenced, whether suddenly or gradually if it followed some other disease, such as fever, or if it could be reasonably attributed to any particular cause, as exposure to cold, accidents, or the like. Ask also if any of the patient's family have been

subject to any particular malady, and if he himself generally enjoyed good health before his present illness.

In every case it is important for you to note the state of the temperature, pulse, respiration, tongue, and appetite, together with the condition of the bowels and the urinary secretion.

THE PULSE

With regard to the pulse, this is caused by the alternate dilatation and relaxation of the arteries into which the blood is forced at each beat of the heart. For convenience it is usually felt at the wrist, but may be counted also in the neck, temple, thigh, or wherever there is an artery near the surface, especially if that artery has a background of bone beneath it. The state of the pulse affords the best indication of the manner in which the heart is doing its duty.

In feeling the pulse the first thing to take notice of is its frequency, *i.e.*, you must attempt to count the number of its beats per minute. The application of a single finger to the artery is sufficient to enable you to count the rapidity of the pulse, but it is better to apply two or three fingers when you wish to estimate its other conditions. The number of beats per minute in the healthy state varies according to age and sex, but may be generally accepted as follows :

At birth and till end of the first year .	140 beats a minute
Infancy and till end of the third year .	120 to 100 beats a minute
Childhood or till end of the sixth year .	100 „ 90 „
7 to 14	90 „ 75 „
14 to 21	85 „ 75 „
21 to 65	75 „ 65 „
Old age	85 „ 70 „

With decrepitude in very old people the pulse becomes more rapid than it was in vigorous middle life. Debility from any cause, when decidedly marked, is mostly attended with lessened force, and a quickened rate of pulse. Irrespective of the actual frequency of the pulse beats, the educated fingers of the physician also receive through the sense of touch much information regarding the quality of the pulse. He must, therefore, in addition to the frequency, take note of its regularity, fulness, strength, and of its resistance to pressure. With regard to its regularity, the pulse is said to intermit when a beat ceases to be felt after every few pulsations. This

condition may attend heart disease, but it is also frequently to be found in old age, in excessive smoking, or tea drinking, and in some forms of indigestion.

The pulse is also irregular when the beats do not occur at regular intervals. This is not an uncommon condition in children, in whom it may occur without serious import. Fullness or largeness of pulse is to be distinguished from strength. A pulse may be large and soft, or, on the other hand, small, firm and wiry as it is called. The strength and fulness of the pulse are of great importance as they indicate the force with which the circulation is carried on. In considering the strength of the pulse you must beware of mistaking a strong pulse for a weak one in which the coats of the arteries are thickened. To enable you to do so in old persons, in whom the pulse appears very strong, always compress the vessel with one finger and move another finger along it below the compression in order to enable you to detect whether any hardening of the coats exists. Normal arteries in young persons cannot be felt when collapsed.

RESPIRATION

Respiration, or the act of breathing, and the method in which the act is performed, is the next matter which should be inquired into. Breathing is consequent on the expansion and contraction of the chest as the air passes into and out of the lungs. There should be no difference in the movements of the two sides of the chest. Breathing, like the pulse, is quickened by bodily exertion and is also affected by mental excitement. The number of breaths taken by a healthy adult in a state of repose both of body and mind is about one to every four beats of the pulse, but varies in different people from fifteen to eighteen per minute. As with the pulse, so there are persons met with in whom the breathing may be either slower or quicker than the standard; but, as a rule, deviation from the numbers given during a state of rest indicates disease. The number of the respirations may be counted either by watching the rise and fall of the chest, or by placing your flat hand on the lower part of it and counting the movements communicated to this. The breathing of children differs in some characteristics from that of adults. The abdominal muscles move more than in adults, and the breathing is much quicker, corresponding with the more

rapid rate of the pulse. Thus a child up to two years of age breathes thirty-five times in a minute; from two to nine years old, eighteen times during sleep, and about twenty-three when awake; from nine years to fifteen, eighteen times during sleep, and twenty when awake.

Indications of disease of the respiratory organs are pains in the chest or side, cough, expectoration, spitting of blood, and difficulty of breathing.

A fetid breath is not commonly a sign of respiratory disease; but any bad odour in the breath should be noted (*see* p. 146).

TEMPERATURE

Another important aid to the diagnosis of disease is furnished by the temperature of the patient.

The normal temperature of the human being is somewhat variable and depends a good deal on the patient, the time of day, and the portion of the body selected for the operation of taking the temperature. The instrument with which the temperature is taken is known as a clinical thermometer, and one such should be in the possession of every one.

Before taking the temperature the mercury should be gently shaken down to about 96. This may be done by holding the thermometer in the right hand, and then tapping that hand against the other. Some thermometers are provided with special arrangements for simplifying the return of the mercury toward the bulb: such is the Repello. The manner in which the clinical thermometer is graduated, and the method of reading it off, are simple (*vide* Fig. 4). The scale is shown in the figure. Each of the longer lines indicates a degree, although as a matter of convenience only every fifth degree is numbered. The spaces between the degrees are divided into fifths by smaller lines. It is easier to read the figures on a thermometer with a flat back.



FIG. 4.

The temperature is measured by placing the thermometer in the mouth, the armpit, or the rectum. Of these the mouth is much to be preferred as a rule, and the thermometer should

be retained in the closed mouth under the tongue for a minute longer than the time it is advertised to be regulated for. When the patient is delirious or unable for other reasons to retain the thermometer in the mouth, then the armpit may be used. For this purpose the armpit should be wiped dry, and the bulb of the instrument placed in the middle of the armpit next the skin for at least 5 minutes. The arm should be held close to the side with the hand lying on the chest, so that the instrument may be entirely surrounded by the patient's skin.

In the case of small children it is better to place the bulb of the thermometer in the groin and bend up the thigh over it. The space afforded for the thermometer is greater here than in the armpit, it is more easily accessible in children, and the leg is more easily controlled, so that there is less danger of the bulb being accidentally broken by the struggles of the child.

When the armpit temperature is efficiently taken it should be about the same as the mouth temperature, but practically it will be found a few points lower. The rectal temperature will be as a rule about 0·6 F. or 0·8 F. higher than the mouth temperature at the same time.

The temperature of men shows a distinct variation during the day. Usually the lowest temperature is in the morning, between 6 and 7 A.M., when before the subject has risen from bed the mouth temperature will be generally 97·6° F. The temperature rises slowly during the day to reach its maximum 98·4°, in the evening, 5 to 7 P.M.; it falls again during the night. Muscular activity and food are the factors mainly responsible for the rise in temperature during the day, sometimes also mental activity or emotion. For this reason the temperature should be taken when the patient is fasting and at rest.

The usual hours for observing a patient's temperature are 8 A.M. and 6 P.M. when it is taken twice daily. Sometimes it is necessary to take the temperature more frequently, in which case four-hourly intervals are usually enjoined, and the hours of 2, 6, and 10 A.M. and P.M. are conveniently adopted.

In any case the temperature should be taken regularly and at the same hours on successive days, and always noted down, being marked on a chart if one is available, so that the course pursued by the fever is evident. Any deviation from the normal temperatures given above, if persistent, indicates

ill-health. Various classifications of temperature have been proposed, but the following is enough for practical purposes :

Collapse temperature	Below 96° F.
Sub-normal temperature	96° to 97° F.
Slight febrile temperature	99·2° to 100·4° F.
Moderate febrile temperature	100·5° to 103° F.
High fever	103° to 105·4° F.
Hyperpyrexia	Over 105·4° F.

Each disease, which runs a definite course, such as the fevers described in Chapter IV, has a more or less characteristic range of temperature. For further information about these diseases and about fever in general the reader should refer to Chapter IV, more especially to the first section in that chapter.

The temperature of children is usually a very little higher than that of adults, and a word of caution is necessary. In children the temperature sometimes increases rapidly, often only from stomach derangement, when there is nothing serious the matter. Care therefore should be taken not to form a hasty conclusion of some serious disease simply because the thermometer indicates much heat of surface, which often falls with equal rapidity. If, however, the deviation from the healthy standard continues for more than twelve hours there is almost certainty that an illness is commencing.

Relation of the Pulse, Respiration, and Temperature

An increase of temperature of 1° above the natural standard corresponds with an increase of the pulse of about 8 beats per minute, and of 2 or 3 respirations per minute. Thus if the natural pulse and temperature were respectively 75 beats per minute and 98·4°, while the number of respirations was 18, an elevation of the temperature to 100° would probably bring up the pulse to 87 or 90 and the respirations to about 23.

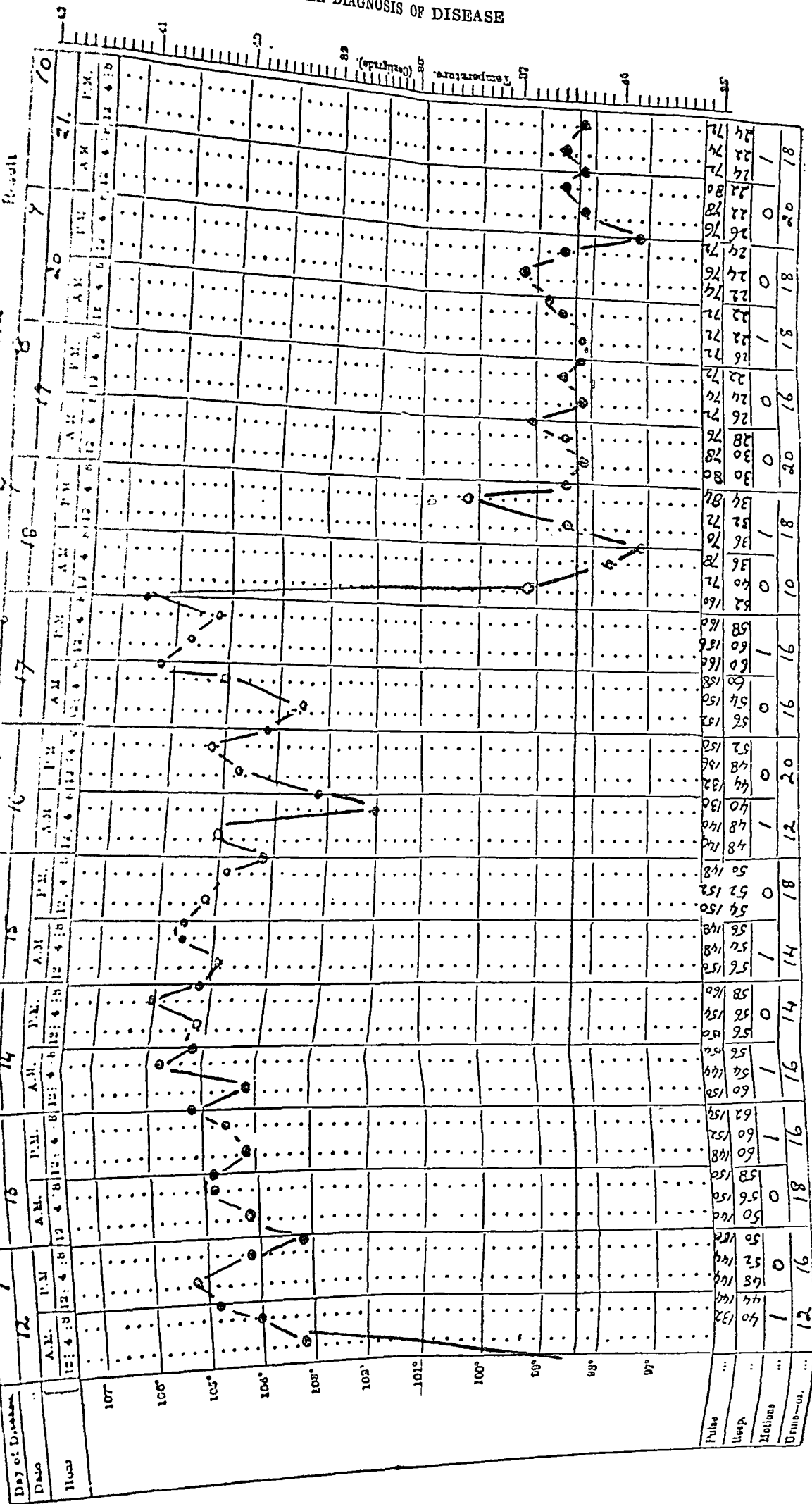
A considerable and persistent deviation from the pulse, respiration, and temperature ratio, *e.g.*, respirations at 40 per minute, while the pulse was only 90, and the temperature 100°, would be a sign of greater danger than a higher range of pulse, respiration and temperature where the ratio kept at its usual rate. Such an increase in the respiration rate comparatively to the pulse is a feature of pneumonia.

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1932. Lobay Pneumonia



THE TONGUE

The appearance of the tongue affords help in diagnosis. The chief points to notice are its size and colour, whether it is moist or dry, and the amount of coating or fur upon it. This fur consists of accumulated dead epithelium from the tongue's surface. Normally the superficial epithelium on the tongue, as it dies, gets rubbed off in the act of mastication. So that if the tongue is subjected to no friction, as is the case with a milk diet, the epithelium tends not to be removed and so forms a fur. Moreover, there will be more epithelium cast off in unhealthy conditions of the tongue, mouth, or stomach, and in febrile states, so that under these conditions we commonly find a marked fur on the tongue.

The following are the principal states of the tongue that are of value in diagnosis :

(1) A thin, white even furring of the tongue occurs normally in some people. It may indicate mouth-breathing, smoking, bad teeth, inflammation in mouth or throat, inflammation of the stomach, or some febrile disease.

(2) A flabby, large tongue indented by the teeth and covered with fur, often yellow in colour, is found in chronic gastritis (inflammation of the stomach) and in forms of dyspepsia that are accompanied by gastritis.

(3) A pale, broad tongue indented by the teeth indicates a debilitated condition, often anæmia.

(4) A narrow tongue, with thick fur especially on the back part, leaving the tip and edges often free, is seen in the height of some fevers, especially enteric.

(5) If the fur described in (4) becomes dry and brown, the 'typhoid state' is usually present ; and the patient's condition very serious.

(6) A tongue with red edges, fur in the middle and on the back, is seen in some forms of dyspepsia.

(7) The tongue may appear purple in some lung and heart diseases from obstruction to the circulation.

(8) A smooth, shiny clean, fissured tongue, which is sore, occurs in certain anæmias and in sprue.

(9) The tongue may be tremulous in extreme debility or from intemperance.

(10) Loss of power of motion of the tongue, or its being drawn to one side when protruded, occurs in some forms of paralysis.

The Gums should also be always examined. They may be soft and tender, and on pressure with the finger pus may ooze out from between the gums and teeth.

PAIN

Pain is the commonest of all symptoms. It is the one thing that every one wishes to avoid. In spite of that fact, pain is a good thing, because it is Nature's warning that something is wrong, and demands our immediate attention to put this something right before matters have gone too far. If it were not for this warning many of us would neglect our diseases until they got beyond treatment. The later stages of some diseases are usually painful enough, but then it is too late. In fact, Nature then gives us too much of a good thing, and pain becomes the bad thing that calls for our attention even when we cannot remove its cause.

It behoves us therefore to be able to interpret this valuable sign as well as possible, and in doing so we shall find certain aids in noting the character of the pain, the time it comes on, and its exact seat. It would be out of place in a book of this nature to discuss all these diagnostic points: it is sufficient to exemplify the first two features by saying that bone pain is usually an intense aching that is worse at night, and that a pain from the pleura is usually worse on taking a deep breath. We may remark here too that there are great differences in susceptibility to pain, both racial and individual, the less civilised races tending to be less sensitive and the more highly strung individuals to be most susceptible. Pain is entirely subjective; we have only the sufferer's word for it as to its presence or intensity, and we must remember that many people habitually exaggerate their sufferings, and some also understate them. Exaggeration in this matter is not as a rule intended to deceive, but arises from egotism and a wish to impress the hearer with the sufferer's necessity. This feature is frequently evident in Indian patients of the poorer classes, who may unblushingly tell you that they have been passing ten diarrhoeic motions a day for three months, when it is obvious from their present state such could not have been the case. Some women also are in the habit of speaking of most things in the superlative, and when it comes to their physical sufferings there is added to this habit a natural feminine desire for sympathy, with the result that every headache is a 'splitting' headache, and the untrained observer

usually a male relative, is scorned if he is unable to see that the splitting headache of to-day is infinitely worse than the headache of last Tuesday, which was described by the same epithet. He will do well if he estimates the relative severity of such pains by noting to what extent the patient is up and about ; but he will do better still if he does not remark on his observation, for he will only be told that such activity is due to the fact that women bear these things so much better than men. And indeed, it often happens that when real and severe pain does come, the sufferer, who has exhausted intense superlatives on milder attacks, now bears it with exemplary fortitude.

From a study of the exact seat of pain there is much to be learnt. Very often the area of skin where pain is felt is immediately over the situation of some deep structure or organ in the body, disease of which is the cause of the pain. A study of Figs. 2 and 3 on pp. 34 and 35, showing the position of the organs, may help to find the origin of the pain in this way. The public are already acquainted with this fact, and like to locate their troubles when they put their hand on the painful area and say, 'It must be my liver.' But only too often are they wrong : pain over the heart is usually not due to the heart, while the advertisers of patent medicines who most graphically represent the agonies of sufferers with their hands on their loins are unnecessarily frightening most of their readers for the great majority of pains felt there do not come from the kidneys. Many pains are 'referred' elsewhere to a part of the body quite distant from the seat of trouble, and this is due to connections which the nerves of the affected organ form near or at the nerve centres with the sensory nerves that come from these distant areas of the skin. For instance, disease of the spinal vertebræ in a child is often first evident as pain at the navel, and may mislead the unwary into thinking the stomach is at fault.

A study of the two diagrams (Figs. 6 and 7) to show the commoner possible causes of pain in various parts of the body, will assist in arriving at a correct conclusion as to the real seat of disease.

In addition to the information to be obtained from the pulse, breathing, temperature, tongue, gums, and pain, various other symptoms occur, which may be of help in diagnosis. Amongst these the nature of the stools, the vomit and the urine will be dealt with in Chapter XIX on Nursing. Such

Diagram to show the commoner causes of pain in certain areas on the front of the trunk.

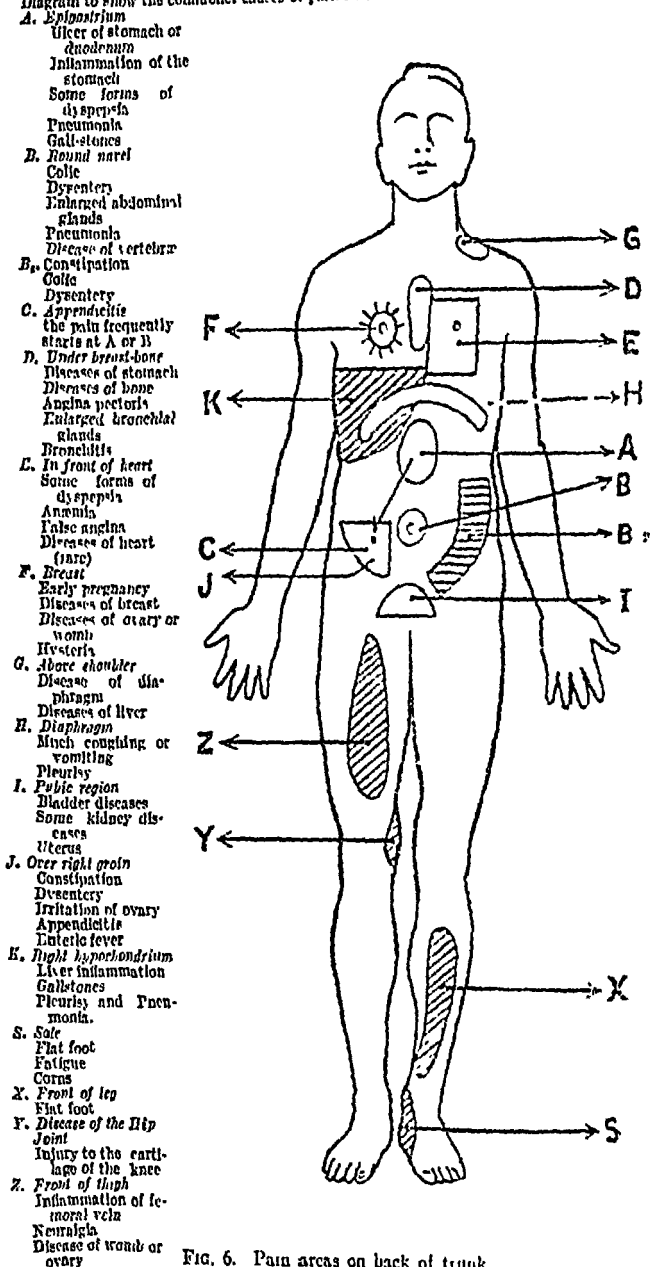


FIG. 6. Pain areas on back of trunk

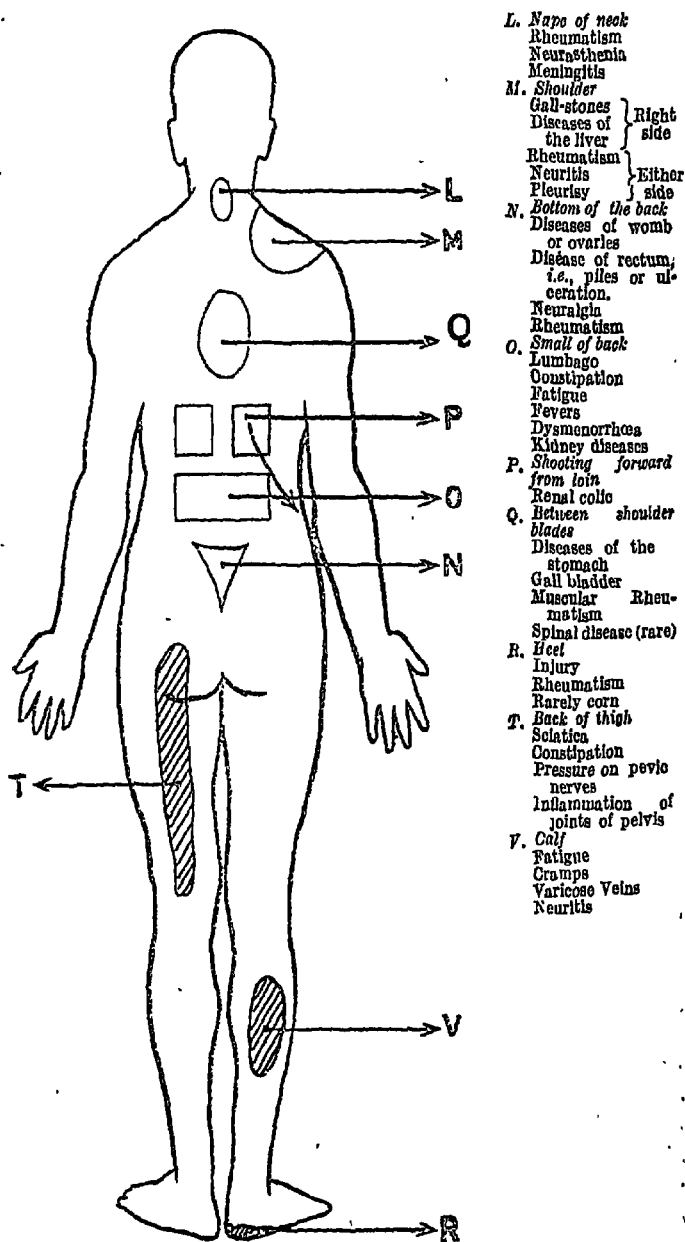


FIG. 7. Pain areas on back of trunk.

symptoms also as cough, delirium, giddiness, headache, palpitation, the urinary condition, and vomiting will be found described under those headings in Chapter VI on Other Medical Diseases; an account of fever is given at the beginning of Chapter IV, and of sore throat in Chapter XII.

Although the foregoing symptoms are usually prominent as indications of the diseases to which they point, it should be understood that disease differs in different people, just as the action of medicines has been shown to vary (*see p. 7*). Sex, habit, age, climatic, temperament, race, and idiosyncrasy exert influences which tend to render similar diseases in different people varied in their characteristics; sometimes one class of symptoms being more prominent, sometimes another. From the above it will be evident that the aim of the physician must be the treatment of each individual case in accordance with the peculiar symptoms presenting; and it should be equally evident that the popular idea of this medicine for that disease must be erroneous, and hence that patent medicines vaunted to cure all, or even many maladies in all persons, must be unequal to so desirable a result.

Signs of Death. As there are instances of persons supposed to be dead recovering, it is desirable to note the *signs of death*. These are: (1) *Cessation of the circulation*: the pulse cannot be felt, and the beating of the heart cannot be felt or heard. (2) *Cessation of respiration*: the chest does not move, a feather held to the mouth is not stirred, and a looking-glass is not made dim by the breath. But none of these signs are infallible, as instances are known of persons being able to suspend circulation and respiration, or at least to carry on these processes so slightly that they could not be recognised. (3) *Coldness of the body, commencing at the extremities*: not infallible, as after death from cholera and some forms of fever, the temperature sometimes rises. (4) *Rigidity of the limbs coming on gradually*: not infallible, as after death from some maladies it is long in appearing, and in the cataleptic condition rigidity may be counterfeited. (5) *Death-like stillness*: not infallible, as after death from cholera startings of the limbs sometimes occur. (6) *Eyes dull, flaccid and shrunken*: not infallible, as after death from some poisons the eyes remain bright for a long time. (7) *Absence of a red colour in semi-transparent parts*, as for instance, the sides of the fingers when viewed with a powerful light behind. (8) *Absence of muscular contraction* on an electric or galvanic

current being applied. (9) *Absence of a blister* on touching the skin with very hot iron, but not sufficiently hot to destroy the skin. Sufficient heat being applied to the skin during life, or within a few minutes after death, produces a blister containing water with a line of redness round. Heat applied after death produces a blister containing air except in dropsical bodies. (10) *On opening a vein water oozes out instead of blood.* None of these latter tests are to be regarded as infallible, as mistakes may occur in their application and in the appreciation of results. (11) *Commencement of putrefactive changes*, usually first seen over the bowels : certain. It will thus be seen that none of the signs of death, excepting the last, are in themselves certain evidence of life having ceased. But taken altogether, the evidence is conclusive.

CHAPTER IV

FEVERS

Fever : Incubation periods : Ague : Anthrax : Beri-beri : Blackwater fever : Cerebro-spinal fever : Chicken-pox : Dongue : Diphtheria : Enteric fever : German measles : Glanders : Influenza : Kala-azar : Malaria : Malta fever : Measles : Mumps : Plague : Pneumonia : Relapsing fever : Rheumatic fever : Scarlet fever : Seven-day fever : Smallpox : Three-day fever : Typhus fever : Whooping-cough : Yellow fever

FEVER

THE word 'fever' is used loosely in two senses. One is that of a body temperature raised above the normal, which the physician more accurately designates 'pyrexia.' The other is in the sense of one of the infectious fevers, such as enteric : we use it in this sense when we say a patient has 'a fever.' A further limitation of this second meaning is sometimes heard in India, when people, speaking of a man having 'fever,' mean that he has the particular febrile disease prevalent in that locality, commonly malaria.

A high temperature may be normal after active exercise, even to 101° F. For the meaning of 'normal' we must refer the reader to our remarks on the clinical thermometer. But in health a rise of temperature from exercise quickly returns to normal. In this the healthy man contrasts with the febrile patient, whose regulation of temperature is imperfect.

It should be understood that the maintenance of the temperature of an adult man, as of other warm-blooded animals, is conducted by an exceedingly delicate nervous mechanism. His internal temperature remains the same whether he be in the Arctic circle or on the Equator, and this is achieved only by the brain's control over the debit and credit sides of the balance-sheet of temperature. Heat is produced by the body in various ways, but especially by the muscular tissue. Heat is lost mostly by the skin : 85 per cent. of all heat loss is by the skin ; and some by the heat of the air

that is expired. The amount of heat-production and of heat-loss is controlled by the nervous centres, and in the healthy adult the control is perfect. In children it is not nearly so perfect. That is why children get 'fever' so much more readily than grown-ups; even from teething or digestive upsets that would not disturb an adult.

We know now that in most fevers there is at first both a diminution of heat-loss and an increase of heat-production, so that in two ways the body temperature becomes raised. An old saying is, 'Feed a cold, but starve a fever.' Like many proverbs, this is fallacious. Colds are best treated with a light diet, and though in fevers the diet should certainly be light also, the patient should not be starved beyond the first twenty-four hours, since the body heat that has to be produced is then only made at the expense of his own tissues, and the patient rapidly wastes. Treating a case of fever without feeding the patient suitably has been compared to raising the temperature of a home by burning it down, and by feeding him with suitable food to raising the temperature by burning coals in the grate. Three stages have been described in fever:

(1) The initial stage, when the patient feels cold, or shivers. A violent shivering is called a rigor. At this stage, although the patient feels cold, the temperature is rapidly going up.

(2) The hot stage. He now feels hot.

(3) The stage of defervescence. This means the coming down of the temperature, which may be gradual, by lysis; or rapid, by crisis. The temperature may even fall 7° in as many hours.

The following names are used to describe certain types of fever:

(1) Continuous. The temperature is high and the difference between morning and evening is but slight.

(2) Remittent. The temperature does not reach normal at its lowest, but there are 2° difference at least between morning and evening readings.

(3) Intermittent. The lowest temperature reaches normal daily: the maximum is high.

(4) Hectic. The morning temperature is normal or nearly so, the evening is at least 3° higher.

A temperature of 105.5° and over is called 'hyperpyrexia.'

Certain *symptoms* are present in most fevers. A chill may initiate a sudden rise of temperature: then there may be

ill-feeling or malaise, thirst, headache, restlessness, mental disturbance—which may reach delirium if the fever be high—sleeplessness, loss of appetite, furred tongue, face flushed, constipation, urine scanty and high-coloured, respiration and pulse quickened. In certain fevers some of these symptoms are accentuated. Thus in pneumonia the respiration especially is quicker, more so relatively than the pulse. Roughly, the pulse rises about 8 beats per minute for every 1° to 1.5° F. rise in temperature, but there is no rule about this.

Fever is usually caused by micro-organisms that make poisons which cause the disturbance; and the height of the fever will depend on two factors: (1) The dose of the poison the patient receives; (2) the natural power of the patient of resistance to this particular infection.

It will be understood from the above that there is really no such disease as 'fever.' Fever is a symptom of some specific disease, or a result due to a particular cause. The treatment here recommended for fever generally is suitable for all diseases which are accompanied by raised temperature, and can be usefully and safely used until the specific disease has been diagnosed.

Treatment applicable to all cases of fever without regard to the diagnosis of a particular case.

Bed. The patient must be put to bed at once to conserve his energy. Even in short fevers he should not be allowed up till the temperature has been normal for at least twenty-four hours.

Diet. If the patient express repugnance to any form of nourishment it will not hurt him to starve for the first twelve or sixteen hours.

Water to relieve thirst, either by itself or flavoured with lemon or lime juice, may be given *ad libitum*: water is preferable to soda-water.

The best food is milk; it is easily digestible and easy to swallow. If it appears to cause indigestion and 'wind,' it may be peptonised. And if curds are passed in the stool, or much wind is evident in the abdomen, whey should be given in place of milk.

On the other hand, if it is only the taste of milk that is objected to, this may be concealed by adding a little coffee. Three pints of milk should be given in the twenty-four hours, in even quantities every two or three hours. If the fever is

likely to last several days, some carbohydrate, as maltine or lactose, should be added to the milk. Two ounces of lactose (sugar of milk) to each pint of milk is a suitable quantity. Some common salt should also be given daily: a little may be added to the milk, or, if preferred, in a little broth daily. But soups, broths, and beef-teas, either home-made or ready bought, are to be discouraged. They give but little energy, and when used in quantity distend the stomach. However, if the patient likes broth, four ounces once daily may be allowed.

Except in malaria, where quinine is a specific, or for the relief of special symptoms, drugs are usually unnecessary during the fevers. Some relief, however, may be obtained by the use of the Diaphoretic Mixture, Prescription No. 41, every six hours: by encouraging sweating this mixture often makes the patient feel easier.

Alcohol in fever as a routine measure is quite unnecessary: sometimes a little is advisable when the temperature is falling rapidly, or during convalescence. Do not give it during the height of a fever unless it is indicated by signs of heart failure or delirium. Good brandy is the best form in which to give alcohol: and it should be administered half an ounce at a time, diluted with water or milk. Champagne, one or two ounces at a time, is useful when there is stomach irritability as well. A champagne tap should be fixed in the cork to prevent the wine becoming flat.

Regarding the treatment of special conditions arising during the course of a fever, we can only mention a few.

(a) **Hyperpyrexia.** Either cold-pack the patient (see 'cold-pack'), or put him in a bath. The bath should be at about 80° F., and should be cooled, after the patient is in it, to 70°. Keep the patient in it till his rectal temperature is 100° F. Then remove him, dry him, put him back to bed; and give him half or one ounce of brandy in water if his pulse show signs of collapse. Do not mind his shivering or looking blue.

If no bath is available, a continual douche may be arranged for the patient by putting him in a mackintosh sheet, grooved so as to drain into a bucket, and pouring cold water over him. Children may be treated by cold sponging till the temperature is down to 102°.

Do not give the patient antipyretic drugs, such as phenacetin or antifebrin, in this condition.

(b) *Insomnia*, if present, is probably due to the fever itself, and should be treated by sponging the patient all over with cold water just before he is wanted to sleep. Having once got him to sleep do not wake him for food, nor even for medicine, except under the doctor's orders.

(c) *Constipation* will usually be present. An enema on alternate days is an excellent plan for keeping the lower bowel clear. In enteric fever it may be unsafe to give a purgative; but in other fevers 1 grain of calomel, repeated hourly till 3 or 4 grains have been taken, or the bowels opened, is a convenient purgative.

INCUBATION PERIODS

After a harmful micro-organism has entered the system it may or may not be destroyed at once and entirely by the protective powers of the body. In the former case no illness is evident. But if the harmful germ succeeds in holding its own against the body then it multiplies, and after a certain period, during which growth is taking place, the poisons that the germ has made begin to exert their deleterious effect on the body cells and the symptoms of disease begin. This period, during which the germs are growing, varies much for different diseases, but is a fairly constant interval for the same disease. It is the interval between infection and the onset of symptoms and is known as the incubation period. The Table on p. 43 gives the incubation period of the more important infectious fevers.

AGUE

Ague. See Malaria.

ANTHRAX

Anthrax is an infective disease of sheep and cattle due to a special bacillus. It may attack men, usually shepherds, workers in hides, or wool workers, who may meet with infected animals. In man the disease may show itself in the lungs, or as an intense poison in the bowels; but usually in the skin of the face or hands as a carbuncle-like inflammation called a 'malignant pustule.'

During the war several cases of anthrax on the face occurred as a result of using improperly prepared shaving brushes, usually of Japanese origin. The spores of anthrax are very

resistant and boiling is insufficient to kill them. A new shaving brush should be soaked in 1 in 1000 solution of per

INFECTIOUS DISEASES

—	Incubation period	Date of the definite illness on which the eruption appears
Cholera . .	A few hours to ten days, usually three to six days.	—
Chicken-pox .	Ten to twenty-one days.	First day and three following days.
Diphtheria .	Two to ten days.	—
German measles	Nine to eighteen days, or even longer.	Second to fourth day.
Influenza .	One to four days, usually three to four.	—
Measles . .	Ten to fourteen days.	Fourth day. The patient is highly infectious for two days before the rash appears.
Mediterranean or Malta fever .	Fourteen days.	—
Mumps . .	Ten to twenty-two days.	—
Plague . .	Two to eight days; in rare cases up to fifteen days.	—
Scarlet fever .	One to eight days, usually three to five.	Second day.
Small-pox .	Twelve to fourteen days.	Third or fourth day.
Typhoid fever .	Seven to twenty-one days, usually ten to fourteen.	Eighth or ninth day.
Typhus fever .	Five to fourteen days—very variable.	Fifth day.
Whooping-cough	Seven to fourteen days.	The characteristic whooping may not appear for three weeks, although the patient is infectious before then.
Yellow fever .	Three to six days, and in rare cases thirteen.	—

chloride of mercury, Prescription No. 18, diluted with 3 parts of water, for several hours.

BERI-BERI

Beri-beri is a common disease in China and in Japan, where it is known as kakke ; it also occurs in India. The nature of the disease is a degeneration of certain nerves, and the symptoms beri-beri gives rise to depend upon which nerves are so affected. Thus in one type of the disease the nerves of the limbs are chiefly involved, and the patient becomes wasted and thin, with loss of power in the lower limbs especially, absence of knee-jerks, and sometimes complete paralysis of the legs. Or there may be diarrhoea and vomiting. In another type there is great enfeeblement of the heart ; the legs become swollen and oedematous and the whole patient may appear fat, puffy, and bloated. In both varieties the calves of the legs are tender on pressure.

There is no rise of temperature accompanying this disease, except sometimes a little at its commencement.

Epidemic dropsy is a disease related in its nature to beri-beri, and resembles the type of beri-beri where the legs become swollen. This dropsy occurs sometimes in epidemic form usually in Bengal, Bihar or the United Provinces in the latter part of the year. There is some reason to think it may be due to stale grain, usually rice, which has been stored throughout the monsoon : the use therefore of grain that is not of the latest crop should be discontinued in this disease.

The *treatment* of beri-beri should depend upon removal of the cause ; but we do not yet know what the cause is in every case. One form of the disease is due to the absence of some essential constituent, called a *vitamine*, from the food. Treatment should consist in giving fresh food, eggs, peas, dhal, whole-meal bread, and vegetables, and in keeping the patient at rest in bed. For the thin or dry variety Prescription No. 51 may be given thrice daily ; for the swollen or wet variety Prescription No. 49 may be given four times a day.

BLACKWATER FEVER

Blackwater fever derives its name from the fact that the urine passed in this disease is very dark in colour : it may be quite black, like stout, or dull red. This colour is derived from *haemoglobin*, the pigment of the red blood-corpuscles, and its presence denotes that there has been much blood destruction.

Blackwater fever occurs mostly in Tropical Africa, and also in some parts of India, especially in Assam and the Duars, in parts of the Madras Presidency, and in parts of Tropical America. It will be noted that all the above are areas where severe malaria is common, and it is found that nearly all, if not all, the sufferers from blackwater fever actually harbour the malarial parasite. The cause of this fever is not yet determined; but it is generally thought to be severe in combination with malaria with another unknown factor.

Attacks usually come on suddenly with high fever, which may remit after a few hours, to rise again later. It is a very serious disease, and competent medical advice should at once be obtained. Meanwhile the patient should be put to bed, and treated on the lines laid down for fever generally. If the urine is definitely very dark, it is best not to give quinine until the doctor's arrival, because in some cases the administration of more quinine appears to do harm, as a general rule if malarial parasites are present in the blood quinine or one of the new allied drugs must be given urgently and preferably by intravenous injection, but this must be left for the doctor to decide but atabrin, 3 tablets a day of 0.1 gm. ($1\frac{1}{2}$ grains) may be given for 5 days in this condition. The patient should be placed at absolute rest; he should be fed by an attendant and a bed pan should be used for the evacuation of the bowels. He should not be allowed to sit up for any purpose whatsoever. If the urine becomes scanty a hot turpentine stupe may be applied to the loins every six hours." Plenty of fluid should be given the patient to drink, water or soda-water, and tea; while the diet also should be fluid, such as whey, milk, albumen water, or Benger's Food. Do not give strong soups.

CEREBRO-SPINAL FEVER

Cerebro-spinal meningitis is an infectious disease, which may occur in isolated instances, though usually in localised epidemics. It is not rare in India, and is especially liable to occur when there is overcrowding of men, as in barracks and tents.

Cerebro-spinal meningitis is a very dangerous disease, though the mortality varies in different epidemics. The disease spreads, like influenza, from the breath of the patient, since the organism is found in the throat. The symptoms

are such as would be associated with inflammation of the membranes covering the brain and spinal cord, intense headache, irregular temperature, vomiting, delirium, and sometimes a dark-spotted rash. Often there is bronchitis, and sometimes this may be the only feature for several days.

Medical aid should be obtained at once: except for the general measures given under the treatment of fevers (p. 40), and the application of ice to the head for headache and delirium, there is little that can be done without a doctor. The doctor will puncture the spinal membranes in the lumbar region for purposes both of diagnosis and treatment; and he may perhaps inject a specific serum.

CHICKEN POX.

Chicken-pox or varicella is an infectious fever with a characteristic eruption: it is usually of a mild nature and occurs mostly in children. The incubation period is up to three weeks: then the patient is seized with slight fever.

The next day an eruption of pink spots appears, first on the trunk, and later on the face. In a few hours the spots become vesicles, i.e., filled with clear fluid, and in two days more they are seen to contain purulent matter.

By the third or fourth day they dry into crusts, which gradually fall off.

The disease is almost always mild, and no treatment in particular beyond isolation of the patient and protecting him from chills is required. The importance of chicken-pox is in its resemblance to mild smallpox, and it is necessary to make the diagnosis with care for fear of neglecting to recognise a case of the graver disease and so allowing it to spread. The chief points in the differentiation of the two diseases are given under the head of Small-pox, and this account should be referred to.

DENGUE

Dengue is a fever known by many other names, of which 'breakbone fever,' in reference to its rheumatic pains, is the best known. It occurs mostly in the tropics in watery and low-lying lands, just in such places as the very common mosquito *Aedes Aegypti* is found, by the agency of which it is spread. It prevails in many parts of India between July and October.

The incubation period is about three days, and after that the onset is usually sudden with severe pain in some part of the body. The temperature rapidly rises to about 103° F., and the pulse quickens. The face is flushed, and the eyes often bloodshot. After two or three days of fever and discomfort the temperature falls, sometimes to normal, sometimes only to 100° F., and continues low for another two or three days, during which time the patient feels much better. The temperature then rises again, perhaps to as high as 103° F., and a rash somewhat resembling measles often appears on the hands and spreads to arms, body, and legs. It is characterised by an intense itching of the palms of the hands and sometimes the soles of the feet. This access of fever lasts only about a day and then falls, usually on the sixth day of the disease. The rash usually lasts a few days more. A feature of dengue is the pains in the muscles, especially those around the joints, which are commonly severe. Many cases of dengue last less than seven days and in many cases there is no rash. An attack of dengue does not confer a lasting immunity, though attacks in subsequent years tend to be milder than the original infection. Recovery is practically certain, as the mortality is *nil*; but a common feature of convalescence is considerable mental and physical depression. The middle-aged should take care not to overexert themselves shortly after an attack of dengue. There is no specific treatment: the measures given above for fevers generally should be adopted, and 10 grains of Aspirin taken thrice daily during the fever.

DIPHTHERIA

Diphtheria is an infectious disease caused by a special bacillus which lodges in one of the mucous membranes of the body, usually that of the throat, nose, or larynx, and there gives rise to a special form of inflammation. This inflammation is characterised by the formation of a thick white exudate from the true mucous membrane, which has the appearance of another membrane and is known as the 'false membrane.' In this situation the bacilli make their poisons, or toxins, which enter the circulation and cause many of the symptoms of the disease. Other symptoms are caused by the actual mechanical obstruction of the false membrane, such as the difficulty in breathing when the diphtheria is in the larynx.

Unfortunately in practice the diagnosis of diphtheria is

sometimes not so simple as the above account might suggest, and for two reasons : Firstly, because not every case of diphtheria shows a false membrane ; sometimes the appearance may be that of a simple sore throat. Secondly, because not every sore throat showing a membrane is diphtheritic. The true criterion of diphtheria is the presence of the special bacillus and hence the diagnosis is not confirmed until that bacillus has been either seen or cultured from a swab taken from the throat.

Diphtheria often prevails as an epidemic, and is highly contagious, especially for those in close contact with the sick, as doctors and nurses. Diphtheria is not so common amongst Indians as amongst Europeans, though here we would make an exception in favour of Bengalis. Nearly all the cases of diphtheria we have seen in India have been in Europeans or Bengalis. Diphtheria is often conveyed by those who have only mild sore throats, yet in whom the bacillus is present ; and these may be the means of conveying a severe form of the disease to others. Articles may become infected by the sick and convey the disease thus indirectly to others ; and milk has been found to be a means of conveyance occasionally.

Bad drains are popularly accused of causing diphtheria, but this is a mistake. A bad smell is only an evidence of faulty sanitation and can do no harm itself. Eighty per cent. of the deaths from diphtheria are in children under five years of age ; in fact, the commonest age for the disease is from the second to the fifth year, though it occurs also amongst adults.

The symptoms of diphtheria begin to show themselves soon after infection, the incubation period being usually two days, though it may be as long as seven. The illness may begin either with fever, and the usual attendant symptoms of fever, malaise, lassitude, vomiting, or the characteristic sore throat may be the first sign. The latter is usually the case. The false membrane is not seen at first, though sometimes it forms very quickly. Sometimes, as we have already explained, there may be no membrane at all. When present it is usually seen as a thick white covering over the tonsils and part of the palate. If present in the larynx there will be loss of voice and difficulty of breathing. If present in the nose there will be nasal obstruction and an irritating discharge that may blister the upper lip. The glands in the neck may become swollen also. The fever is not high : it is usually only about 101° F.

when at its height, and commonly falls altogether on the second or third day of the disease. This feature helps to diagnose the disease from a severe tonsillitis, where the fever tends to be higher. In diphtheria there is often danger of heart failure, sometimes very sudden : and if any signs of this, such as a weak pulse, show themselves, the child must be kept quite recumbent.

In laryngeal diphtheria there is the added danger of suffocation from the membrane blocking the air passage, and to obviate this the operation of tracheotomy is sometimes necessary.

Sometimes there is a diphtheritic membrane in the larynx without there being signs of a membrane in the parts of the throat that are visible to the unaided eye. In such cases there may be considerable doubt whether the child has diphtheria or only catarrhal laryngitis. Both conditions have been popularly referred to as 'croup' : the former sometimes as membranous croup. But croup is a word best avoided, as it does not actually express the one important point we wish to know, whether the diphtheria bacillus is present or not. If a conclusion cannot be come to on this point, it is best to regard the case as one of diphtheria. In both conditions there will be signs of obstruction in the larynx, usually more severe in the diphtheritic laryngitis : and both conditions may be associated with broncho-pneumonia.

Diphtheria may be followed by paralysis affecting one or many nerves. About one-tenth of all cases suffer in this way, the paralysis usually coming on gradually quite late in the illness when the patient is convalescing. This paralysis is usually recovered from as gradually as it sets in, but sometimes it continues to progress, and, if it affects the important nerves of respiration, may be fatal.

The two diseases from which diphtheria of the throat has to be *diagnosed* are scarlet fever and tonsillitis. In scarlet fever the temperature tends to be higher and the rash and initial vomiting are stronger features, and the membrane in the throat is not characteristic. From a severe tonsillitis the diagnosis may be more difficult ; here also the temperature will be higher and the pus in the throat usually in small pellicles and not as a continuous membrane. But the finding of the diphtheria bacillus is necessary to confirm.

The *treatment* of diphtheria consists in the administration of antitoxin as early as possible and in full doses. The size

of the dose is to be regulated not by the age of the patient, but by the severity of the disease. About 6000 units should be injected at once and repeated daily till the membrane begins to separate.

The wonderful effect of antitoxin in saving the lives of countless children from diphtheria is one of the strongest arguments there is in favour of the justice of vivisection when performed under proper control.

Besides antitoxin, the throat must be disinfected so far as possible. After removing as much of the false membrane as will come away, carbolic acid and glycerine should be applied to the red patch left underneath by means of a swab of wool on the end of a probe or small stick. The correct strength is 25 per cent. of carbolic acid with glycerine.

If swallowing is very painful ice may be given to suck just before the milk is given. But often it is necessary to feed a child only by the nose, passing a soft male catheter through the nose down to the gullet and pouring milk in by means of a small funnel attached. The diet should be milk only. Sometimes benefit may be obtained by the administration of the following prescription :

Perchloride of mercury	.	.	.	1 grain.
Potassium iodide	.	.	.	30 grains.
Glycerine	.	.	.	2 drachms.
Water	.	.	.	to 8 oz.

One tablespoonful of this is a suitable dose for an adult and it should be repeated six-hourly. The patient should be in a warm, but ventilated, room, and the atmosphere round the bed moistened by means of a bronchitis-kettle. Sheets should be arranged round the bed-head to form a 'tent' (see p. 60). When the disease is in the larynx, the application of hot fomentations to the outside of the throat may assist, suddenly changing at times to crushed ice if the breathing becomes bad. But the doctor in such cases will be ready to perform tracheotomy, or intubation ; and when signs of obstruction are seen the tracheotomy instruments should be kept prepared in case they are wanted urgently.

The convalescence from diphtheria is usually a long one and the patient should not consort with his fellows until bacteriological examination of the throat has shown that no diphtheria bacilli are present.

Diphtheria antitoxin may be obtained in India from the

large Government bacteriological laboratories, such as the Central Research Institute in Kasauli who issue the following instructions with the antitoxin :

(1) *Early Treatment.* In a case of diphtheria it is most important that serum treatment should be commenced as early as possible. Every hour's delay after the first day is valuable time lost. In a doubtful case it is much better to give serum at once than waste time waiting for a diagnosis. Should the case not turn out to be one of diphtheria no harm is done. The early administration of a large dose of diphtheria antitoxin is the keynote of successful treatment. When time is wasted the antitoxin will not undo the harm which has already been done by the toxin.

Statistics show that success is almost certain in every case when serum treatment is commenced early.

(2) *Method of Injecting the Serum.* The serum may be injected hypodermically in the flank or side of the abdomen, using any sterile syringe provided with a good needle.

The skin at the part selected should be sterilised by rubbing it with a pledget of cotton wool soaked in 1 in 10 carbolic acid, or any other efficient antiseptic. A fold of the skin is pinched up between the finger and thumb, and the needle of the syringe introduced into the subcutaneous tissue, and the serum slowly injected. On withdrawing the needle the part should be again rubbed a few times with the same pledget of wool in order to stimulate the skin to contract so as to close the needle puncture and prevent oozing.

(3) *Dosage.* It is much better to give a large dose at the outset than a series of smaller doses at intervals.

Four thousand units is a suitable dose for a child three to six years of age. In severe cases more could be given with benefit, and a further dose of, say, 2000 to 3000 units, after eight to ten hours where improvement is not marked. The severity of the case would suggest the amount to be given, and also whether a repetition of the dose was necessary.

(4) *Prophylactic Use.* A dose of from 1000 to 2000 units confers a passive immunity for about three weeks, and this amount may be given to the other members of a household where a case of diphtheria occurs.

There is an efficient preventive inoculation against diphtheria now obtainable and in the event of an epidemic the doctor should be consulted whether it is advisable to have this done.

ENTERIC FEVER

The name 'enteric' includes typhoid and the paratyphoid fevers. These fevers resemble one another clinically and are due to allied organisms, the bacilli of typhoid and of the paratyphoid fevers. Of paratyphoid there are at least three varieties, known respectively as paratyphoid A, B and C.

Recovery from an attack of one of these fevers is, as a general rule, a protection against a subsequent attack by the same kind of organism; but does not afford much protection against an attack by one of the allied bacilli. These fevers are so like one another that a certain differentiation cannot be made except by bacteriological methods. They will therefore all be described under the name of 'enteric' fever; usually, but by no means always, an attack of paratyphoid is not so severe as one of the true typhoid fever.

The enteric organism gains entrance to the body by means of the intestinal tract, that is to say it is swallowed; it then, by means of the circulation, invades the entire body and the toxins that it makes poison the tissues and produce the effects that we see clinically.

It is important to understand that every case of enteric fever arises from sewage contamination, that the disease cannot arise anew, but that one patient sickens from infection by the excrement of a former patient, directly or indirectly, and that this infection always enters by the mouth. The infection may be conveyed in several ways:

(a) By contact; nurses, attendants, or relatives of the patient are liable, after touching the patient or his clothes or some article that has been in the patient's use, to convey the bacillus to their own mouths.

(b) By water, either directly from drinking unsterilised water, or indirectly from articles, such as milk-cans, salads, &c., that have been washed in infected water. It is the water that is usually to blame in widespread epidemics.

(c) By flies; numerous bacilli adhere to the flies' legs and may be conveyed by them from sewage to human food.

(d) By enteric carriers. An enteric carrier is a person who has had, and apparently recovered from, enteric fever, but still carries in his body the enteric bacillus, which he continues to excrete with urine and faeces. Such an abnormal condition is a constant source of infection, since one so affected

may be in the position of a cook or milkman and so liable frequently to infect fresh subjects.

The enteric bacillus is an organism very resistant to harmful influences ; it will survive drying and even freezing.

Certain races are more subject to enteric fever than others. In India the young European is especially liable. Indians may also be infected, especially Gurkhas or other hillmen ; but usually in Indians the disease is milder. No age is exempt ; in children the disease is often unrecognised. Enteric fever is commonest in the young adult and in those who have not long dwelt in India, but it has been known even in the elderly.

The incubation of enteric fever varies from ten to fourteen days, or a little more.

The onset of the disease is usually gradual with feelings of malaise, aching all over, loss of appetite, and severe headache, the intensity of which is usually a feature of the first week of the illness. The typical course of enteric fever is divided conveniently for the sake of description into four weeks.

During the first week the temperature gradually rises to 103° or 104° F., and the tongue becomes thickly coated. The pulse is rapid, but often not so rapid as it is in other fevers with the same temperature. There may be constipation or diarrhoea. If diarrhoea is present the stools may be thin and yellow, having the appearance of pea-soup. In India, however, constipation throughout the illness is more frequent than diarrhoea. There is usually a slight cough present : careful examination of the chest will always show signs of bronchitis. The spleen becomes slightly enlarged ; and at the end of the week there may appear small pink spots on the abdomen, chest, and back. These spots, the ' rose spots ' as they are called, fade if pressed upon. They are often not present, and are very difficult to detect upon the dark skin of an Indian.

During the second week the intestinal symptoms may be aggravated, and the abdomen somewhat distended and tender. The headache, however, goes, leaving the patient dull and heavy. The temperature has now reached its height and will show only slight morning remissions, except in a mild case where it may begin to return to normal about the end of the week. Delirium is common at this stage, especially at night.

During the third week the morning remissions of temperature should be more marked, becoming subnormal in the

morning, and the evening temperature showing a gradual decline. But the diarrhoea, if present, and abdominal distension, may be worse at this time. Moreover, this is the time fraught with danger of some complications, as pneumonia, or the more serious ones of hæmorrhage from, or perforation of, the bowel.

By the beginning of the fourth week the patient has become extremely thin, and careful nursing is necessary to prevent the formation of bedsores. In a favourable case, however, convalescence is now beginning, and though very weak the patient is beginning to feel the return of appetite. The tongue by the end of the week should be quite clean. At this stage care is required to prevent a hungry patient securing forbidden articles of diet. In an unfavourable case the patient is still delirious, and lies in what is known as the 'typhoid state.'

Enteric fever has been called a three weeks' fever: it may last any time from ten to sixty days, but from two to four weeks is about the average. Recrudescences and relapses of the fever, after return of the temperature to normal, greatly prolong the course of the disease, which at the best of times has a long and trying convalescence.

The possible complications and sequelæ of enteric fever are many, but cannot obtain further notice here. The diagnosis of enteric fever in its early days may be difficult: later on the temperature chart and general clinical picture usually are sufficient to name the disease. Amongst the general features that help in the early diagnosis of enteric fever are the intense headache, the furred tongue, the comparatively slow pulse, the age of the patient, and the gradual onset of the fever. Amongst special means of diagnosis are the isolation of the enteric bacillus from the blood or excreta of the patient and the Widal agglutination test. The first test is absolute and, if possible, should always be done; otherwise there is no certainty as to which particular variety of enteric fever the patient has. The Widal test is often not so decisive. These tests can only be done when a laboratory and a bacteriologist are accessible.

Treatment. The treatment described for fevers in general should be read here and the principles followed in the treatment of a case of enteric fever. There is no specific medicine for this disease; the treatment is expectant, and the successful attendance in a case consists more in good nursing and in

careful attendance to the diet than in anything else. Actual drugs may be entirely unnecessary, and should not be given as a routine measure, but only when called for by some particular event in the case.

As an antiseptic for the intestinal canal the chlorine mixture, Prescription No. 45, is given to many every four hours; but we obtain equally good results without it, or by giving cinnamon oil, 2 minims, in emulsion four-hourly only, when flatulence is troubling. The standard food during this disease should be milk; but on the first appearance of distension of the abdomen, or of curds in the stools, whey should be substituted for the milk, either in whole or in part. Albumen water may also be used if the diarrhoea or distension is great; but there is not sufficient nourishment in this alone to maintain the patient for long. Do not give soups or meat extracts, unless indicated later in the disease when milk becomes nauseating, and then only for short periods and in small quantities. They have the effect of stimulants then for a short time, and are useful to create an appetite and to supply salt, but when given largely tend to dilate the stomach.

Four ounces of milk, every three hours, with lactose added, is as much as the patient can be expected to take at first. Later the amount can be increased to six or even seven ounces; and one or two hen's eggs daily may be added.

When the tongue is cleaning and the temperature has been normal a few days the patient's appetite may begin to become ravenous. It is then that particular care must be taken that nothing except the diet ordered is given to the patient. Pastry or potato has been responsible for many a relapse or perforation of the bowel, resulting in death. As a drink during the course of the fever, barley-water flavoured with lemon-juice is excellent; and in any case the juice of one or two lemons or limes daily is advisable. As a routine measure alcohol is unnecessary. It should only be given when specially indicated for a weak pulse or for delirium in the form of brandy. It may be necessary to give as much as four ounces or more in the twenty-four hours, giving it in half-ounce doses as described under the Treatment of Fevers.

The patient should certainly be washed all over every day; while sponging with cold water to reduce the temperature will sometimes help to get him to sleep. For hyperpyrexia the coldpack is to be used as described in Chapter XX. Some special points in the nursing of enteric patients

are given in Chapter XIX. Particular care must be taken in dealing with the excreta of all enteric patients (*see* Chapter XXII, p. 615).

If diarrhoea is troublesome, whey only is to be given as food, and the Bismuth Mixture, Prescription No. 42, may be given every four hours.

Should hæmorrhage occur from the bowel food should be stopped and the patient kept absolutely quiet. He should not be moved, except gently for the necessary processes of cleansing. In the event of perforation no measure short of surgical operation is of avail.

For severe headache, the application of crushed ice, or of a handkerchief wrung out in eau-de-Cologne, to the head is soothing.

As the patient convalesces the diet may be gradually increased, from eggs to thin toast, grated toast-crumbs, custard puddings, jellies and so on, to boiled fish and minced meat. At this stage also it is advisable to give hexamine, 5 grains twice a day, for a week as a routine measure in order to sterilise the biliary and urinary tract and prevent bacilluria, not only for the patient's benefit, but as a safeguard to those round him to prevent the urine being a means of carrying infection.

The convalescence from enteric fever is always a long one : it should be remembered that the patient is often to some extent mentally as well as bodily affected. A prolonged rest should be allowed him, and in the early stages thereof he must not be allowed to exercise himself unduly at games or otherwise ; neither should he be hurried in his return to work.

INOCULATION AGAINST ENTERIC FEVER

Besides carrying out the general rules of sanitation and paying attention to the precepts laid down in Chapter XVIII on the Preservation of Health, there is in addition a means of special protection for the individual against the enteric fevers. The newcomer to the East should understand that enteric fever is his principal danger, and that he should do everything possible to protect himself against it. All newcomers and those going on active service or into camp life anywhere, and especially those doing much travelling are advised to undergo inoculation against the enteric fevers by two successive doses.

The vaccine T.A.B. consists of an emulsion of dead typhoid and paratyphoid A and B bacilli. Just as an attack of typhoid fever protects one against another attack of typhoid fever for a few years, so an injection of typhoid vaccine produces sufficient immunity to protect one against typhoid fever for one or two years. The efficacy of this preventive inoculation against fevers of the enteric group is now thoroughly established. Its effect in reducing the incidence of these diseases is well shown by the following figures for cases of enteric fevers per thousand in the American army:

1908—no inoculation	5.72
1909—inoculation voluntary	3.35
1912—inoculation compulsory	0.31
1913—ditto	0.04

In the South African War the British army suffered heavily from enteric fevers—incidence 105 per thousand with a death rate of 14.6 per thousand. But in the Great War of 1914 to 1918 as a result mainly of preventive inoculation the incidence rate fell to only 2.35 per thousand with death rate of 0.139 per thousand. Preventive inoculation not only considerably lessens the chance of getting a typhoid fever but also increases the chances of recovering if one does get fever. Thus the death rate in cases which had been inoculated was from one-half to one-third of the death rate in uninoculated cases in the British army in the Great War. Accordingly it is sheer folly for any one who is going to be exposed to infection to neglect the great protection given by inoculation. Even those who have had one of the enteric fevers should be inoculated because the immunity gradually wears off and in any case they require to be made immune to the other enteric fevers that they have not had. Two or more doses of vaccine give a much greater protection than a single dose. Most people get a little fever about 6 hours after the injection of vaccine. Because of this it is usually best to receive the injection in the afternoon or evening. Some susceptible individuals are more severely affected and may have to stop in bed the next day. Slight tenderness at the sight of inoculation generally occurs. It is most important to remember that *indulgence in alcohol, however small, interferes with the proper development of immunity*. So no alcohol should be taken on the day of inoculation nor on the subsequent day. Ordinarily re-inoculation is advised every two years. But

in situations of particular danger re-inoculation every year is advisable.

GERMAN MEASLES

German measles, or rubella, is a mild infectious fever characterised by a rash.

The incubation period is about eighteen days; and the majority of those attacked are children between five and fifteen years of age. The disease is common in cold and temperate northern climates, but appears rare elsewhere.

The first sign of illness is usually the rash, which is bright red and in appearance something between that of scarlet fever and measles. It usually fades in a few hours. There is mild fever to about 100° or 101° F. for two or three days and usually some sore throat. Almost always there is enlargement of certain glands, especially those at the back of the neck and at the angle of the jaw. The disease is always a mild one.

No *treatment* is usually necessary beyond keeping the patient in bed, and, however mild the attack may be, he should stay in bed five days and indoors for another four days, and be isolated from other children for three weeks altogether.

A table of differential diagnosis of German measles from scarlet fever and measles is given under the head of the last-named disease.

GLANDERS

Glanders is an infective disease of horses, that is sometimes conveyed to grooms and others coming in contact with a diseased horse, usually by inoculation on to skin already abraded. The disease may be acute or chronic, and may affect principally the nose, or be a general blood-poisoning, *i.e.*, a septicæmia, or a pyæmia with numerous abscesses.

The acute form is nearly always fatal; the chronic form may recover after a prolonged illness.

There is no specific treatment yet known, the treatment being in accordance with indications as they arise.

INFLUENZA

People have become familiar with the nature of influenza since the pandemic of 1918-19. They know it to be an extremely infectious disease attacking the respiratory passages

and varying in severity from a brief and mild fever to a fatal broncho-pneumonia. The world seems subject to great epidemics of influenza at intervals of about thirty years. For some time after each epidemic cases occur in fewer numbers until another outburst of the disease attacks the next generation. The cases that occur in between the epidemics are difficult to distinguish from those of ordinary bronchitis and broncho-pneumonia ; but when an epidemic occurs the cases as a whole have certain characteristics that enable us to recognise the disease.

The organism causing influenza has not yet been discovered : it is ultramicroscopic. A particular bacillus used to be referred to as the influenza bacillus : it is known now that this bacillus is not really the cause of influenza, but only a secondary organism. It appears that the true influenzal organism causes as a rule a brief fever, but that it prepares the way for many other or secondary organisms to invade the lungs and bronchial tubes, and when this occurs, the subject has pneumonia or bronchitis.

This explains why influenza is sometimes evident as a brief fever, lasting two to five days, but always leaving the patient weak. If he is attacked by the secondary organisms, the patient's temperature will rise again, still higher than it has already been, and the symptoms of a respiratory catarrh perhaps become evident. This catarrh may not extend beyond the throat, but may go lower, causing bronchitis, or lower still, when it is called broncho-pneumonia.

A special feature of influenza is the amount of prostration that may follow an attack : the convalescence is usually long. The weakness is liable to affect the heart muscle, and therefore undue exertion should not be undertaken shortly after an attack of influenza.

In the large majority of influenza cases the respiratory organs alone are affected ; but sometimes influenza may attack the gastro-intestinal tract, causing gastritis with vomiting or enteritis with diarrhoea.

Sometimes the nervous system is attacked, and troublesome sequelæ may remain after such an event.

Treatment. The patient must be put to bed at once, isolated so far as possible, put on milk diet, and the general treatment for fevers adopted.

Half-doses of the Quinine Mixture, Prescription No. 36, may be given four times a day. If the fever is high, then

Prescription No. 41 at four-hourly intervals may give relief. Any sign of sudden cardiac weakness should be dealt with by the administrations of brandy in half-ounce doses and of Mixture No. 38. Should bronchitis or pneumonia supervene, the treatment appropriate to those conditions should be adopted. Acetylsalicylic acid, whose trade name is aspirin, has a popularity in this disease, and to relieve pain in the back or joints or reduce temperature may be of use in 10-grain doses; but the dose should not be repeated more than once without medical advice. Such antipyretic drugs as antipyrin, antifebrin, phenacetin, and pyramidon should certainly not be given in influenza without medical advice; owing to the tendency to cardiac weakness in this disease, they may when used unadvisedly cause fatal collapse.

A doctor, if available, should always be summoned to deal with any of the respiratory complications of influenza, since these may rapidly become serious. Moreover, it may be possible to treat some of these cases by means of an influenzal vaccine or serum, which can only be administered by a doctor.

An influenzal vaccine or an anti-catarrhal vaccine may be used to protect the healthy against respiratory complications. Such protection is valuable when an influenzal epidemic is threatening, or in institutions like schools, or as a routine measure twice a year for those who are particularly susceptible to catarrhal attacks. The vaccine may be made from a patient's own discharges when it is called 'autogenous', though equal protection can usually be obtained from one of the stock vaccines sold for the purpose by the most reputable laboratories. No such course should be entered on without asking the medical adviser.

KALA-AZAR

Kala-azar is a chronic fever caused by a parasite found in the spleen and in other organs of the sufferer.

It is now practically certain that the parasite gains entrance to the human body by the bite of a species of sand-fly, *phlebotomus argentipes* (see p. 100): but we still have much to learn about the details of its transmission. Kala-azar is commoner among the poor and hangs about certain dwellings, as has been observed in the coolie lines of Assam tea gardens.

The disease is common in parts of Assam and Bengal, occurs in Madras and has been found as far west as Lucknow and the Simla hills. A similar disease is known also in Africa and along the Mediterranean coasts.

The chief characteristics of kala-azar are enlargement of the spleen and liver, periods of continuous high fever lasting several weeks and alternating with periods without fever, great anæmia, with a tendency to bleeding from the gums, nose, and elsewhere, wasting of the limbs, and general weakness. It is a special feature of the fever that if the temperature be taken four-hourly, two maximum rises per diem will often be seen.

Kala-azar is an extremely serious disease and, if left to itself, will almost invariably prove fatal. Of recent years, however, a satisfactory treatment has been discovered in the intravenous injection of certain salts of antimony. It is highly necessary that any one suspected to be suffering from this disease should be taken at once to a doctor; since the patient's hope lies in early diagnosis and prompt treatment on the above lines.

MALARIA*

(1) **The Parasites and the Fever.** Malaria, or malarial fever, is also known by the names paludism, marsh fever, jungle fever, ague, and periodic fever. It is often called by local names, such as country fever, West African fever, Burmah fever; and varieties of it are called intermittent fever, remittent fever, pernicious fever, and blackwater fever.

Malarial fever occurs more or less in all warm climates, especially in the summer, after rains, and near marshy ground; and causes a quarter or more of the total sickness in the tropics.

It is caused by enormous numbers of the minute parasites of the blood called *Plasmodia*.

These parasites are introduced into the blood through the proboscis of certain species of the mosquitoes called Anophelines.

* From Professor Ross's book on the 'Prevention of Malaria' (John Murray, London). The following sections on prevention up to the clinical account of malaria are taken with Sir Ronald Ross's and Messrs. Murray's permission. This part may be purchased separately under the title 'A Summary of Facts Regarding Malaria' for two pence.

On being introduced, each parasite enters one of the red corpuscles of the blood, in which it lives and grows.

On reaching maturity each parasite divides into a number of small forms, sometimes called 'spores'. These leave the infested corpuscle and attack fresh corpuscles; and this method of propagation may be continued indefinitely for years.

Thus, though only a few hundreds or thousands of the parasites may have been originally introduced through the mosquito's proboscis, their number rapidly increases until as many as some millions of millions of them may exist in the blood.

At first, while the number of parasites is still small, the infected person may remain apparently well. When, however, the number is large enough, he begins to suffer from fever.

All the adult parasites of each generation tend to reach maturity at approximately the same time, and it is at the moment when the young forms escape into the blood stream that the patient's fever begins.

The fever is probably caused by poisonous products which are set free when the mature parasites burst and liberate their progeny into the blood stream.

After from six to forty hours or more this poison is eliminated from the patient's system; and his fever then tends to leave him.

In the meantime, however, another generation of parasites may be approaching maturity, and may cause another attack of fever like the first; and so on, indefinitely, for weeks or months. In this manner the attacks of fever follow each other at regular intervals.

But it often happens that before one attack has entirely ceased another one commences; so that the attacks overlap each other, and the fever is continued.

After a time, even without treatment, the number of parasites may decrease until not enough of them are left to produce fever, when the patient improves temporarily.

Such an improvement is often of a temporary nature only. It generally happens, however, sooner or later, that the number of parasites increases again, when the patient again suffers from another series of attacks.

Such relapses are frequently encouraged by fatigue, heat, chill, wetting, dissipation, injury, childbirth, and attacks of other illness.

They may occur at intervals for a long time after the patient was first infected, and after he has moved to localities where no malarial infection is present.

It is probable that as long as one parasite remains alive in the patient's blood he may remain subject to such relapses.

Besides fever, the parasites often produce anæmia and enlargement of the spleen, especially in patients who have suffered from many relapses.

Death is sometimes caused by sudden and grave symptoms, such as coma, collapse, high fever, &c. The symptoms known as blackwater fever, or hæmoglobinuria, may occur in old and neglected infections, and these are often fatal. In young children severe convulsions may be the first indication of grave and often fatal malaria.

Death is also often caused during the course of a malarial infection by other diseases, such as pneumonia or dysentery acting upon a constitution already enfeebled by the parasites.

If the patient survives, the parasites tend to die out of themselves, without treatment, after a long period of illness—leaving him more or less 'immune.'

The parasites are at least of three kinds, which can easily be distinguished in blood placed under the microscope. These are (1) the parasite which divides into 'spores' every three days and causes *quartan fever*; (2) the parasite which divides into 'spores' every other day and causes *benign tertian fever*; and (3) the parasites which cause the so-called *malignant fever*, in which dangerous complications most frequently occur.

If a little blood containing any one of these species of parasites is taken from a patient, and is then injected into a vein or under the skin of a healthy person, the latter will almost certainly soon become infected with the same species of parasite.

Closely similar parasites are found in monkeys, bats, squirrels, and birds. Such animal parasites, however, do not infect man, as far as can be determined.

As proved by centuries of experience, cinchona bark, from which quinine is made, possesses the power of destroying the parasites and curing the attacks. But it will not generally destroy all the parasites in the body unless it is given in sufficient doses and continued for several months; and as long as a single parasite remains alive in the blood infection is continued and the patient may be subject to relapses.

(2) **The Mode of Infection.** Besides those forms of the malaria parasite which produce spores in the human body, there are other forms, male and female.

When certain species of the mosquitoes called Anophelines happen to feed on a patient whose blood contains the parasites of malaria, these are drawn with the blood into the insect's stomach.

If mature sexual forms of the parasites are present these undergo certain changes in the mosquito's stomach; the fertilised females pass through its wall, and finally fix themselves to its outer surface—that is, between the stomach and the skin of the insect.

In this position they grow largely in size, and after a week, in favourable circumstances, produce a very large number of spores.

The spores find their way into the insect's salivary glands. This gland secretes the irritating fluid which the insect injects through its proboscis under the human skin when it commences to feed; and the spores can easily be found in the fluid by the microscope.

Thus when a proper species of Anopheline, which has more than a week previously fed upon a patient containing the sexual forms of the parasites of malaria, next bites another person, it injects the spores, together with its saliva, under his skin—that is, generally into his blood.

These spores can cause, or may cause, infection or reinfection in this second person, as described at the beginning of this summary.

Numerous birds, monkeys and men have been infected experimentally in this manner with their own species of parasites.

Thus the parasites of malaria pass alternately from men to certain mosquitoes, and back from these mosquitoes to men.

A very large number of parasites are known which pass in this manner from one animal to a second animal which preys on the first; and back again from the second animal to the first.

It is not known with certainty when and how this process first commenced; but probably all such parasites were originally free living animals, which by the gradual evolution of ages acquired the power of living in other animals.

Thus also, it is evident that malarial fever is an infectious

disease which is communicated from the sick to the healthy by the agency of certain mosquitoes.

From the time of the ancients it has been known that malarial fever tends to be most prevalent in the vicinity of marshes.

The parasites of malaria have never been found in the water or air of marshes ; nor in decaying vegetation ; nor in the soil. Attempts to produce infection by these have always failed. But the Anophelines which carry the parasites breed in marshes, in marshy pools and streams, and in various kinds of collections of water.

Rising from these marshes, they enter the adjacent houses and feed on the inmates, mostly at night ; biting first one person and then others ; and living in some instances for weeks or months.

If an infected person happens to be present in any of these houses, the infection is likely to be carried by the Anophelines from him to the other inmates, and to neighbouring houses.

Thus the whole neighbourhood tends to become infected, and the locality is called 'malarious.'

In such localities the parasites of malaria may be found in Anophelines of the proper species ; even as many as 25 per cent. or more of them may be infected.

Such infected Anophelines when taken from a malarious locality to a healthy one (*e.g.*, from the Campagna, near Rome, to London) will still infect healthy persons whom they have been caused to bite.

So also, in malarious localities, the Anophelines bite the healthy new-born children, and infect many of them.

Such children, if not thoroughly treated, may remain infected for years ; may become anæmic and possess enlarged spleens ; and may spread the infection to others. Later, however, at the age of 12 years or more, the survivors tend to become 'immune,' *i.e.*, tolerant to the poisonous effects of the parasite infection. Under such conditions, although parasites may still be present in the body, yet the person seldom shows any clinical symptoms.

In many malarious localities almost every child has been found to contain the parasites of malaria, or to possess an enlarged spleen.

In such a locality, therefore, the infection is constantly passed on from the older children, or from adults, to the

new-born infants ; so that the locality may remain malarious for years, or for centuries.

Similarly, a new-comer arriving in such a locality is very likely to become infected, especially if he sleeps in an infected house even for one night.

A locality is said to be malarious only when healthy persons become infected in it ; not when persons who have become infected elsewhere happen to reside in it.

A locality is *malarious* only when the following factors are all present—(1) persons already infected with parasites ; (2) sufficient numbers of the proper species or varieties of *Anophelines* to carry the infection to healthy persons ; and (3) climatic conditions favourable for (*a*) the longevity of the mosquitoes and (*b*) for the development of the malaria parasites in them.

The chances of infection tend to be great in localities (1) where there are numerous infected persons not treated with quinine or similar drugs ; (2) where there are numerous *Anophelines* of the proper species not prevented from biting ; or (3) where the climatic conditions are favourable for the life history of the mosquitoes and for the development of the parasites in their bodies.

Conversely, the chances of infection tend to be less where infected persons are excluded, or properly treated for the disease ; where the *Anophelines* are few in number or are prevented from biting ; or where the climatic conditions are unfavourable to the life of the mosquito or to the development of the malaria parasite in its body.

(3) Facts about Mosquitoes. Gnats, which in the tropics are commonly called mosquitoes, belong to the zoological family of insects known as the *Culicidæ* (from the Latin *culex* a gnat). They are distinguished from other insects by a number of characters, and always possess only one wing on each side, and a long proboscis.

Like that of other insects, their life is divided into four stages, the *egg* ; the *larva* (or caterpillar) ; the *pupa* (or chrysalis) ; and the *imago* (or adult, winged insect).

The *egg* is laid on water or near it, and in warm, moist weather hatches out in a day or two.

The *larva* or wriggler is entirely aquatic, and always lives in water. It swims and dives by means of paddles and hairs, and feeds on various aquatic organisms. It cannot, however, breathe under water, but must always rise to the surface in

order to obtain air. After a week or more it becomes a *pupa*.

The *pupa* or tumbler still remains in the water, generally floating on the surface. After two days or more its skin cracks, and the imago emerges.

The *imago* remains standing for a little while on the empty floating skin of the *pupa*, and then flies away.

Both males and females are able to suck fluids through the proboscis. As a rule the male feeds only on the juices of plants; but the female sucks the blood of men, beasts, birds, and reptiles. The female often returns to water every few days in order to lay her eggs, of which she may deposit several hundreds at a time; and then seeks another meal.

Female gnats have been kept alive in captivity for months.

In unsuitable weather both males and females may take refuge in damp places, such as cellars, wells, out-houses, and woods, where they may remain for months until better conditions prevail.

As a rule gnats, like other animals, tend to remain in the locality where they were born; but a few may occasionally stray to the distance of half a mile or more from their breeding-places. If, however, plenty of places, where they can obtain food, exist near at hand, there is no reason why they should travel further for it. They must also remain near water to drink and to lay their eggs in.

Gnats are generally favoured by warm moist weather, by plenty of water suitable for their larvæ, and by abundance of food. They tend to be diminished by various kinds of bats, birds, fish, insects, and spiders which devour them or their larvæ.

During its life, a single gnat may succeed in biting many persons or animals, and in propagating diseases amongst them.

The family Culicidae or Gnats is divided into many sub-families and genera, and contains more than one thousand known species. Among the Anophelines there are recognised about 150 species, but not all these are dangerous from the point of view of malaria. There are about 46 species of Anophelines in India, but only about half-a-dozen of these are considered to be really important as malaria carriers.

Although all these species have many habits and structural characters in common, yet they all differ in small details.

These have been described at length in a number of special books written on the subject.

In the tropics, as a broad general rule, the gnats which most concern human beings belong to the groups called *Culex*, *Stegomyia*, and *Anopheles*.

Culex pipiens is a very common gnat in Europe, and an allied species, *Culex fatigans*, is found almost everywhere in the tropics. The larvæ occur principally in tubs, barrels, cisterns, and other vessels containing water, in stagnant ditches, garden pits, holes in rocks and trees, and so on. They possess a long breathing tube close to the tail fins; and float at the surface of the water with the end of this tube attached to the 'surface film', and the head hanging downwards. When disturbed, they wriggle at once to the bottom. The adult insects generally present a uniform grey appearance, with pale yellowish bars across the back of the abdomen, and plain unspotted wings. They bite almost entirely in the evening and night, and principally indoors (in the tropics). The parasite which causes elephantiasis, namely, the *Filaria bancrofti*, is carried by them or allied species in a manner very similar to that in which the Anophelines carry the parasites of malaria.

Aedes (Stegomyia) aegypti, sometimes called *Stegomyia fasciata* or *Stegomyia calopus*, and allied species are very common in the tropics, but much less so in temperate climates. The larvæ breed in much the same places as those of *Culex*, but more frequently in vessels. Any old biscuit-tin or oil-tin, flower-pot, broken bottle and crockery, tub or barrel, choked drain, roof gutter, &c., in which rain or other water has collected, is almost sure to contain them, and they frequently occur in holes in trees and in certain plants. They possess a short stumpy breathing tube, and float head downwards, like the larvæ of *Culex*. The adult insects are more or less striped or speckled black and white, and have plain unspotted wings. They bite chiefly in the daytime, and often abound in woods and in the shade of trees. *Aedes aegypti* is usually a domestic species, occurring commonly inside, or in the neighbourhood of, human dwellings. In America and Africa this and allied species carry yellow fever. In India and many other parts of the tropics, the same insect is responsible for the spread of dengue.

The Anophelines consist of about one hundred and fifty known species, some of which carry malaria and are always

found in malarious places. The larvæ occur chiefly in water on the ground, particularly in water which stands or

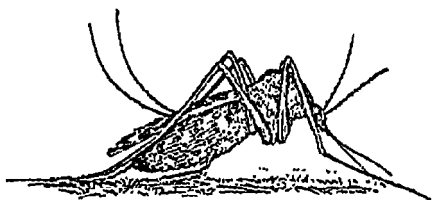


FIG. 8. Female Culicine mosquito sitting in the characteristic attitude.

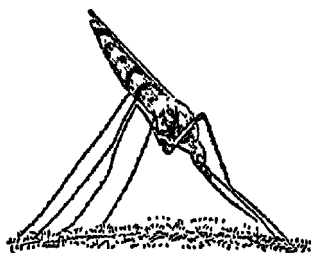


FIG. 9. Female anopheline mosquito sitting in the characteristic attitude.

flows amongst grass or water weeds ; the larvæ of the dangerous species usually prefer clean water. Thus they abound in the weedy margins of rivers, streams, lakes, and ponds in small sluggish streams and streamlets ; in watercourses, drains and gutters choked with weeds ; in pools of rain water lying on grass ; in pits from which earth has been removed, such as the ' borrow pits ' by the side of railway embankments ; in cisterns, in wells and in pits used for watering gardens ; in ornamental water in hollows in rocks ; and in water at

the bottom of boats, &c. Thus while the larvæ of many species of *Culex* and *Aedes* (*Stegomyia*) may occur in small collections of water which abound in and around houses, the Anophelines breed chiefly in marshes,—streams and ponds. Owing to the fact that malaria is often more or less connected with marshy conditions, it is also called marsh fever or paludism. The larvæ feed chiefly on the surface of the water—on which they

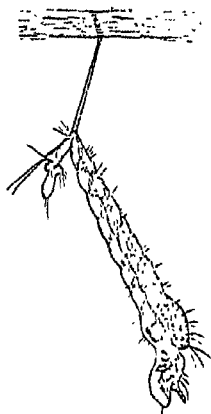


FIG. 10. Calicine larva enlarged.

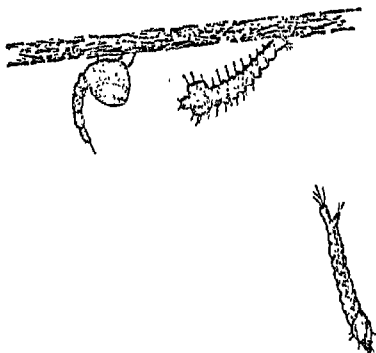


FIG. 11. Anopheline larvæ and pupa.

float like sticks, and not with the head hanging downwards. When disturbed they swim away backwards on the surface, and sink to the bottom only when much alarmed. They have no breathing tube, like those of *Culex* and *Stegomyia*. The adults are speckled brown and white, or black and white; and generally the wings are not plain, but possess three or four black marks along or near the front border. When the insect is seated at

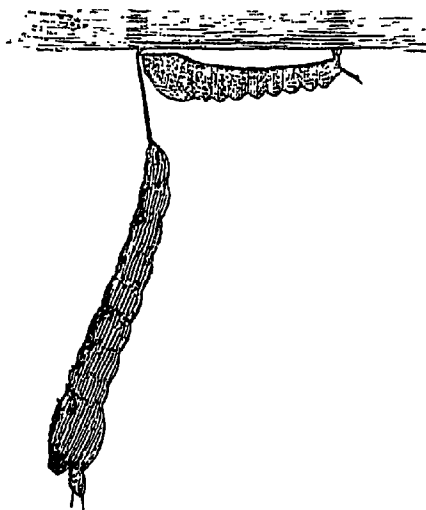


FIG. 12. Culicine larva and
anopheline larva side by
side.

rest on a wall, the tail projects outward at an angle from the wall; whereas the *Culex* and *Stegomyia* sit with the tail hanging downwards, or even nearly touching the wall. All these facts enable any one to distinguish at sight both the larvæ and the adults of Anophelines from those of other kinds of mosquitoes. Anophelines bite chiefly at night or in the dusk—owing to which the malarial infection is generally acquired at night. They enter houses, but also bite in the open in spots sheltered from wind.

(4) **Personal Prevention.** It is extremely dangerous to sleep in a house which is occupied, or has recently been occupied, by infected persons, especially native children; or in, or close proximity to, an infected village. If they can avoid it, people should not go to live in known malarious

places, nor close to an infected population. Not only avoid being bitten, but avoid being put in situations where you are likely to be bitten.

Even under such circumstances, however, the chances of acquiring infection can be very considerably reduced by the careful use of certain measures of personal prevention.

(a) *Mosquito Nets.* One of the chief precautions is the proper use of a mosquito net.

Never sleep in a malarious area, except under a good rectangular mosquito-net, the mesh of which should not be less than 16 to the inch. The net should always be hung *inside* the poles and be so long that there is plenty available to tuck beneath the mattress. The latter article is essential for the proper use of a net.

The net should be stretched tightly, in order to allow every breeze to enter it, and also to prevent it sagging against the body. In the latter case mosquitoes may bite through the meshes of the net. Sleep so that your limbs do not come against the net. The longer and wider the bed, the less is the chance of being bitten in this manner, and the more airy the net. With narrow beds especially, have the net made with a strip of calico along the free edge. This cloth should extend up a foot above the level of the bedding, so that bites are prevented.

Do not use fancy nets with side openings, slits, bell-shape, &c. Do not have a net which hangs down to touch the floor all around, as mosquitoes often hide under the bed during the day and come out at night inside the net. Inspect your net daily to see that it is invariably in good repair, and has not the slightest rent.

Make sure that your servant invariably puts down the net for use early in the afternoon. See that he never leaves a corner folded on the bed for ingress, and that he tucks the net well under the mattress all round.

When going to bed ascertain that the net is properly tucked in. Take an electric torch with you to bed and search carefully for mosquitoes inside. This is best done by shaking three sides of the net once or twice and waiting a little, mosquitoes are then likely to be found on the undisturbed side. They may then be caught by placing a tube or a wide-mouthed bottle over them and closing the receptacle with a piece of cardboard slipped under the edge. Or if the hands be soaped it is easy to catch them with the hand. A good practice is

to keep a "Flit" gun in the bedroom and to flit the inside of the net thoroughly before retiring for the night.

Immediately on rising in the morning, put up the net by collecting the hanging portion together, twisting it into a coil and throwing it over the top bar of the net frame. Do not let it hang down when manipulating it over the bed, and *never loop it around the frame.*

Do not think such an amount of trouble is ridiculous ; it is well worth doing and custom makes it less tiresome.

(b) *Clothing, etc.* After sunset always wear sufficient clothes to protect the whole body from mosquito bites. Never wear short sleeves or shorts after sundown. Either wear two pairs of socks or stockings, or else wear mosquito boots. Mess Wellington Boots worn in the evening, instead of Oxford shoes, are a very effective preventative for those who possess them. Mosquito boots are made of soft chamois leather, or white canvas, and can be made to order in India. They should be long enough to overlap the protective covering of the legs.

Ladies often contract malaria by being bitten on the legs. In the absence of proper mosquito boots, long bags of calico or linen like bolster cases, into which the exposed extremities can be thrust, are useful. These should always be used when sitting around at dusk or afterwards. Loose beach pyjamas overlapped by mosquito boots are preferred by some ladies.

Beware of cane-seated chairs, if your clothes be thin enough to allow mosquitoes to bite you when your garments are tightly stretched. A piece of newspaper spread on such chairs is a preventive.

(c) *Mosquito Repellents.* For the protection of the head and hands, head-nets and gloves are sometimes used. There are, however, many circumstances under which their use is not practicable. Repellents or culicifuges are useful under such conditions, especially in the case of young children, or where men have to be out at night for limited periods in malarious situations.

A useful formula for a culicifuge is

Oil of citronella	2 ounce.
Spirits of camphor	1 ounce.
Cedarwood oil	1 ounce.
White petroleum jelly	2 ounces.

Citronella oil is sometimes used, and in an emergency a little kerosine oil or a lime cut in half may be used. It must be remembered, however, that the benefits derived from one application of such repellents usually wears off in an hour or two and the substance must be reapplied.

A little of the repellent should be rubbed on the wrists, the ankles, behind the ears, at the back of the neck and on other exposed portions of the skin. Some should be applied over portions protected by thin clothing only. Some people recommend a little of the culicifuge used as a hair pomade at night.

Several of the proprietary fly-spray solutions are useful culicifuges. The use of these on clothing and on hangings in rooms tends to deter mosquitoes.

Mosquitoes often shelter in the dark under dining tables and bite persons at meal times. Some form of incense, such as Katol sticks, &c., may usefully be burnt under tables at such times.

Punkahs and electric fans are not only useful to drive away mosquitoes, but also help to keep the body cool, comfortable and vigorous, even in great tropical heat. Apart from its cooling effects, a hand fan is also a useful weapon to keep mosquitoes away from the head and hands.

(d) *Measures for the destruction of mosquitoes.* These insects may be destroyed in either the adult or the larval stages.

(1) *Destruction of adult mosquitoes.* (i) The killing of adult mosquitoes by swatting with a fly-flap is advantageous. These should be looked for in cup-boards, behind curtains, and in dark corners of rooms. Large numbers can often be killed on the inside of windows and glass doors just at sunset, when they are attempting to escape from the houses.*

(ii) *Spraying.* Several of the popular fly-spraying solutions on the market are very useful in the destruction of

* In hot dry climates, if the windows and doors be opened for about half-an-hour before and after sunset, large numbers of mosquitoes will leave houses. The doors should be shut again to prevent their re-entry later. The latter is especially the case early in the morning, when many insects again seek the shelter of houses. It is at this time that servants usually open all doors to sweep out the house, and this allows the entry of large numbers of mosquitoes which may be very troublesome.

adult mosquitoes. A spray of this make has the following composition :

Carbon tetrachloride	1 part.
Oil of wintergreen	2 parts.
Kerosine oil (2nd quality) . .	97 parts.
Napthalene	$\frac{1}{4}$ lb. to a gallon of mixture,

Such solutions may be applied by means of hand sprayers which are obtainable everywhere at a trifling cost.

(iii) Fumigation was formerly much recommended for the destruction of mosquitoes, but spraying has usually been found cheaper and more effective.

(iv) Traps for mosquitoes consist of boxes with a dark lining. Attracted by this colour the insects enter the box for refuge during the day. The lid or shutter of the box is then suddenly closed and the mosquitoes within are killed with a little ammonia or chloroform poured into the box through a protected opening. Or the lid can be made to slide down to the end of the box in such a manner as to crush the inmates. Traps are usually not very effective in the prevention of malaria, as most of the mosquitoes captured are not Anophelines. They may, however, help to mitigate the mosquito nuisance in houses.

(v) A small butterfly-net of white (not green) muslin may be kept in the house for the purpose of catching troublesome mosquitoes during the day ; and the servants may be taught to use it.

(2) *Destruction of larval mosquitoes.* The householder should always take care that no stagnant water is allowed to remain anywhere on his premises, in cisterns, drains, gutters, tubs, jugs, flower-pots, gourds, broken bottles and crockery, old tins and other water-holding rubbish, or in holes in trees, or in certain plants such as pine-apples, in all of which mosquitoes are apt to breed. If the water cannot be drained off or emptied out, the larvæ of the mosquitoes in it may be destroyed by pouring a little kerosine oil on it. This should be done once a week ; and the householder should make it a habit to inspect his premises for this purpose every Sunday.

In the case of fire-buckets, these should be filled with cresol or phenyl solution. Cisterns and receptacles for drinking or other water should have mosquito proof covers, or should be screened in such a manner as to prevent mosquitoes laying their eggs on the surface of the water. These covers

should never be left open, and it must be remembered that these insects can enter through very small cracks or holes.

All adjacent pools, ponds, tanks, streams, etc., which cannot be dried up, should have their edges clean-cut. The edges and surface of such water should be kept free from aquatic vegetation and small fish encouraged to live in them. Excess of jungle should be removed from around houses, as this not only hides collections of water, but also prevents the rapid drying of the soil after rain. Such jungle shelters mosquitoes during the day.

If he follow this advice the householder will generally obtain a great reduction in the number of the mosquitoes in his house. If, however, the plague continues, he should appeal to the local sanitary authorities for assistance and advice.

(e) *Mosquito-proofing of Houses, etc.* Those who can afford it should endeavour to have their dwellings properly mosquito-proofed with wire gauze. Under such conditions, it is essential that all openings, such as windows, etc., should be properly covered and that all entrances into the building should have double doors, provided with automatic closing arrangements. In planning the mosquito-proofing of a bungalow, it is usually advisable to obtain expert advice in the matter, if the results are to be satisfactory.

It is not sufficient that a bungalow should be mosquito-proofed. It is necessary that the wire gauze should be inspected almost daily to detect any tears or breakages; these should be repaired at once. Servants should not be allowed to wedge doors open, and no chocks should be provided for this purpose. Servants have a very common habit of propping doors open in the early morning, when sweeping out the bungalow. This is an especially dangerous time, as many mosquitoes are then seeking shelter from the sun and gain access to the house. Under such conditions the good effects of the proofing may be largely annulled.

If it be not possible to mosquito-proof the whole bungalow, it is a great protection if a verandah on the cool side of the house can be proofed properly. Such an apartment can be used for meals and sitting out in the evening, while if electrical fans are also available the comfort is greatly added to.

During the rains, if your bungalow be not mosquito-proofed make a temporary protected living room from mosquito-netting, butter-cloth, etc., stretched on a large frame. Proper

corner pieces can be obtained for such rooms and any desired size can be constructed. The door can be made as a sleeve. Such a large netted room may be a distinct source of comfort as well as of health in areas where mosquitoes are very prevalent.

To summarise, the proper way to protect yourself against malaria is not to be bitten, if you can possibly avoid it. Quinine is a thing to fall back on in case of failure. Remember that an attack of fever from a stray infected mosquito is not likely to be so severe as if you are bitten by many such mosquitoes. The worst attacks often follow a severe night's biting in some strange place. When there is grave danger of infection under such adverse circumstances, 5 grains of quinine should be taken regularly every day just before breakfast; but it is advisable to take a double dose at least once a week—say, on Sundays. If you do get fever, treat it promptly with quinine or a similar drug.

(5) **Public Prevention.** As a broad general rule, malaria causes a quarter or more of the total sickness in the tropics. The debility produced by frequent attacks of this disease renders the patient more liable to acquire other diseases. In India probably one million people die each year from malaria, and over 100 millions suffer from this disease each year.

Malaria can always be greatly reduced, or may even be extirpated in any locality, provided the money is available.

Large marshes in populous places must be drained deepened or filled up. Breeding places of mosquitoes, which cannot be abolished by such measures, should be made unfavourable for multiplication of mosquitoes by the use of larvicides, such as oil, Paris green, cresol, etc., or by biological methods suitable to the local conditions, such as fish, shading, etc. When it is necessary to store water for any purpose, means should be taken to prevent the access of mosquitoes to it.

A proper permanent organisation must be established for dealing with the smaller breeding places of Anophelines, and for the distribution of quinine—especially to infected children. Other measures, suitable to the local conditions, should be adopted where called for.

In many instances the cost is likely to be more than recouped by the saving of life, labour, invaliding, medical attendance, and hospital accommodation. This is more especially the

case where a large number of persons are resident in a small area.

The campaign will tend to remove other mosquito-borne diseases as well as malaria: and will tend to improve the general sanitation of the locality where it is undertaken.

CLINICAL FEATURES OF MALARIA

From the above account it is seen that malaria may be due to one of three parasites, the quartan, the benign tertian, or the malignant tertian. Each of these parasites produces its peculiar type of fever. In quartan fever the attacks recur every seventy-two hours, in benign tertian every forty-eight hours, and in malignant tertian in something less than forty-eight hours.

Each of these parasites may, however, produce a daily or quotidian fever. This occurs when different broods of the parasite are maturing on successive days. Thus three broods of the quartan parasite maturing on successive days may give rise to a daily fever of the same character as one due to two successive broods of either of the tertian parasites. In such cases the diagnosis between them is only to be made by the microscope. The nature of the febrile attack or ague in the case of each parasite is much about the same, and the following account of an attack of ague may be taken for any variety of acute malaria.

The Ague Fit. After a certain period of malaise, accompanied by headache, weakness or pains in the limbs, the patient begins to feel cold and to shiver. In some forms there is a well-marked rigor, the teeth chatter, and the bed even may shake. At the beginning of this chill the temperature is found to be about 100° F., but it rapidly rises to 104° or 105° F. This cold stage lasts from a quarter to half an hour and is succeeded by a hot stage. From having previously wanted all the blankets piled on him the patient now begins to throw off all his coverings. The skin is hot and dry, the pulse fast, and the eyes may be bloodshot. At times there is vomiting and diarrhoea. This hot stage lasts four hours, often rather more, and then the sweating stage begins. The sweat is first noticed on the forehead and the palms of the hands, and then becomes general. With the sweat there is general relief; even before sweating is noticed the temperature and

pulserate begin to fall and continue to do so rapidly. After three or four hours of this the patient feels much better, and often finishes by falling into a deep sleep from which he awakes much refreshed.

Such attacks may occur at the periodic intervals peculiar to the infecting parasite, or they may be daily. In the interval between attacks the patient feels fairly well, but weak; he often goes about his usual work.

Sometimes, usually in the severer malignant forms, the temperature may be remittent instead of intermittent; and this may be accompanied by jaundice with bilious vomiting and diarrhoea. This is known as bilious remittent fever and is a dangerous form since in spite of treatment the temperature may continue to rise and the patient may die. These remittent fevers were formerly classed as distinct diseases; but many of the cases so included were really enteric fever, and the majority of the remainder were these forms of severe malaria.

The malignant tertian parasite may also cause what are known as pernicious symptoms, which affect usually either the brain or the gastro-intestinal canal in particular, and may give rise to coma, or various forms of paralysis or symptoms resembling cholera or dysentery, or to extreme exhaustion in other ways.

The above forms are known as acute malaria. In chronic malaria there may be repeated attacks of slight fever, which may be unnoticed, and these will often develop enlargement of the spleen and liver, anæmia, and dark pigment of the skin and tongue, with sometimes a slight yellow tinge in the eyes. In bad cases the anæmia and enlargement of the spleen are very marked. In malaria it is more usual to get relapses than not. Even when an acute attack has been apparently cured by quinine, and the parasite disappears from the blood, yet it may be still present in the spleen and elsewhere. When that is the case, anything that tends to lower vitality, such as chill or fatigue, may cause the reappearance of the parasite in the blood and another ague attack. This explains how it is that Englishmen returning from the tropics may get malaria in Britain after an interval of years. It also explains how it is some people think that malaria can occur without the mosquito. The mosquito was necessary for the first attack, and the parasite never having been entirely banished relapses may occur at any time.

For the proper *diagnosis* of malaria the microscope is necessary. If, however, any fever shows a definite recurrence every forty-eight or every seventy-two hours with an afebrile period in between, that must certainly be malaria, as no other fever shows this periodicity continuously.

Moreover, usually malaria except the malignant type will yield to quinine if 30 grains daily be given for three successive days. So that if a fever will not so yield, it is not likely to be benign tertian (the commonest form of malaria), or quartan fever.

In the absence of medical advice, the *treatment* of malaria consists in the administration of quinine, or, if this be not available, of one of the other preparations of cinchona such as cinchona febrifuge or totaquina. There are several new drugs for the treatment of malaria (plasmoquine, atabrin, etc.), which are useful under special circumstances, but these should only be taken under medical advice and supervision.

The sulphate of quinine is the commonest form of the drug used, as it is the cheapest. The kind of the drug does not matter if it be given in solution. The more soluble salts, such as the bihydrochloride, the bihydrobromide and the bisulphate, are best, if the drug be administered in the solid form. Whatever form of quinine is used the drug should be given by the mouth or rectum, in the absence of medical advice.

Many people say they cannot take quinine, but a real idiosyncrasy to the drug is rare. What is really meant is that they dislike the taste of the form given, or that they object to the ringing in the ears and other symptoms which the drug produces. The fact that the drug causes ringing in the ears indicates that it is being absorbed, and preparations, which do not produce this symptom, are probably not being absorbed and are therefore not having their full curative action. A dose of one of the bromides often helps to alleviate these unpleasant results.

For those who can afford it, the bihydrobromide is preferable to the other salts, as it is more soluble and gives rise to less buzzing in the ears. The proprietary preparation, euquinine, is very useful for children, as it is nearly tasteless. Quinine tannate made up with chocolate, or given with some sweet condensed milk, is also pleasant for children.

Prescription No. 37 is a useful quinine mixture. One ounce of this should be given thrice daily to persons weighing about 11 stone, and in all cases of high fever in adults. For

ordinary attacks of ague in persons of about 8 or 9 stone weight, one ounce may be given twice daily. This dosage should be continued for at least a week and preferably 10 days, after which it may be discontinued unless another attack occurs, when it should be repeated.

Treatment should be started *as soon as the diagnosis of malaria is made*, irrespective of the presence or absence of fever. It is important that the patient should be prepared for the quinine, to ensure a good absorption and the maximum effect of the drug. The bowels should be freely opened by a dose of 3 or 4 grains of calomel, followed later by half an ounce of Epsom's salts. It is very necessary that the bowels should continue free during treatment, and this result is attained by giving a dose of Epsom's salts, or similar saline purgative, each morning, or by adding half a drachm of Epsom's salts to each dose of the quinine mixture. The drug acts better if the patient be given large doses of alkali, sodium bicarbonate (baking soda) especially during the early stages of the disease, when fever is present. A teaspoonful of baking soda, in plenty of water, should be given every half hour at the beginning of treatment for 6 or 7 doses, and afterwards every two hours daily. This substance tends to flush out the poisons, and also helps the action of the quinine. The patient should be given as much fluid as possible, preferably in the form of fresh lemon—or lime-squash. If these drinks contain large amounts of sugar, it is helpful in maintaining the strength of the patient.

Besides the specific treatment with quinine, phenacetin 5 grains combined with caffeine citrate 2 grains, or aspirin 10 grains, may be given during fever to relieve the headache; but these antipyretic drugs must not be taken too often.

As regards diet, give the patient as much fluid as possible. In persons who habitually take alcohol, a moderate amount of stimulant may be given. The patient should not be starved; fats should be avoided at all stages of treatment and a meat diet given only sparingly during the acute manifestations. Abundant vegetables and fruit, such as oranges, tomatoes, apples and pine-apples, should be taken. A large amount of sugar is useful. After the quinine treatment has stopped an iron and arsenic tonic, combined with a diet of liver, may be given to counteract any anæmia.

Should the patient have frequent relapses of the disease, he should consult a doctor, about taking some special course of

treatment, possibly with one of the newer drugs. A change to a cooler climate may help ; this change should not be sudden if possible, or a fresh attack of ague may be provoked. It is sometimes advisable under such changed conditions, to take 5 grains of quinine daily for about a week.

For travellers, or those in camp, the quinine must be in an easily portable form, either as tablets, pills or powders. Any of these will do, though it must be remembered that the drug in such solid forms is less liable to be absorbed, and so is less efficacious, unless very soluble preparations be used. Powder is the cheapest form of all, and is usually quite efficacious, if the bowels be kept open, but its taste is extremely bitter. The tablets are good when fresh ; if stale, they are inclined to become hard on the outside and may not be dissolved in the stomach. If tablets be used, they should not be sugar-coated, and should preferably be made of one of the more soluble salts, such as the bihydrochloride, the bihydrobromide or the bisulphate. Tablets should be taken with a large amount of fluid, and, if there be any doubt as to their solubility, they should be broken up finely before being swallowed.

Nearly always one of the above forms of quinine can be retained in the stomach, when taken by the mouth. In some cases where the drug cannot be retained, the bihydrochloride, 20 grains dissolved in water, and mixed with two ounces of starch solution, may be injected *per rectum*, after this has been cleared out by an enema. It is best to add 10 minims of tincture of opium to such an injection. This method is useful in the case of children in convulsions due to malaria, and a proportionate dose of the drug should be used.

Children stand quinine well, and to a malarious infant under one year 1 grain six times a day may be given ; between one and three years give $1\frac{1}{2}$ grains six times a day. The treatment should be continued after the fever has gone down.

MALTA FEVER

Malta fever, sometimes called Mediterranean fever or undulant fever, was formerly considered to be peculiar to the southern Mediterranean coast ; but is now known to be not uncommon in parts of India, notably in the Punjab and in Bundelkhand. Consideration of the above areas will show that as a whole they are not fertile, but largely rocky and of scant vegetation, the sort of ground where a goat will pick up a better living than a cow. And that is the explanation of

the disease being found in such places, since it has been shown that the organism causing the fever is commonly harboured by goats, and appears in their milk, and in this way man may become infected. The obvious means of prevention is not to drink goat's milk unless previously sterilised, and such means have been eminently successful in converting Malta from a very unhealthy to a healthy station for troops.

The incubation of the fever takes fourteen days; and the disease then begins with the usual signs of fever the temperature gradually increasing for four or five days and remaining at about 103° F. for about two weeks and then gradually declining. The spleen is somewhat enlarged and tender. After this remission there is a relapse, another remission and another relapse, and so on, usually for several months. The disease is not a very fatal one, but is very exhausting, and convalescence is long. The joints are often swollen and painful. Although such is the typical course of the disease, the gradual waxing and waning of which give it its name of undulant (wavy) fever, this is not the form in which it is more commonly seen in the poorer Indian classes. They have usually passed through most of the febrile stages undiagnosed and with home remedies, and present themselves later for some troublesome complication or sequela. These complications are usually either swollen and painful joints, which might be thought rheumatic, obstinate neuritis, especially in the form of sciatica, or inflammation of the testis.

There is no specific treatment for Malta fever; the treatment must be on the general lines indicated for fevers and their attendant symptoms.

MEASLES

Measles is an infectious fever characterised by an eruption and by catarrh of the upper part of the respiratory passages. All races and all ages are liable, but most people receive infection in childhood, especially between the ages of six months and two years, and after recovery become immune to further attacks.

The incubation period is usually ten days, but may be more or less; and after that the disease begins with catarrh of the eyes, nose, and throat, and with a rise of temperature to about 102° F. The eyes water and appear bloodshot, and the child being unable to face the light, turns his head away to the wall

well ventilated, but no draught allowed to fall on the patient. Sponging the child twice or thrice daily with tepid water containing vinegar is a useful measure. A bronchitic-kettle is beneficial, and should certainly be employed if the bronchitis is a prominent feature. Let the child drink as much as he wants; milk and water and Imperial drink (Chapter XXI), or barley-water, are useful to quench the thirst. The instructions given for the general treatment of fevers should be followed, but the patient should not be purged after the first or second day, as diarrhoea sometimes occurs in children.

Should broncho-pneumonia occur the treatment for that disease should be followed.

Isolation should be strictly observed throughout the illness for the benefit of other children. No one but the nurse or attendant relatives should be allowed in the room till three weeks after the rash has disappeared, and then only when all clothing has been disinfected. Measles is infectious throughout its course, even during its incubation, and especially so just before the rash comes out.

MUMPS

An infectious disorder, consisting of inflammation of a gland called the 'parotid gland,' situated behind the jaw, below, and in front of, the ear. It generally occurs in children, but sometimes in adults, and seldom attacks the same person twice. It commences with slight 'fever.' After a few hours, or perhaps in a day or two, a swelling, often of almost stony hardness, is noticed on the cheek and under the ear, extending along the neck towards the chin. This lump is exceedingly painful, and continues swollen for four or five days, while the skin is often red. It then gradually disappears, leaving no trace. The swelling of mumps very seldom 'gathers.' It may affect one or both sides of the face. It is contagious, and sometimes runs through a whole family or school. The period of incubation is long, ten to twenty-one days. In severe cases swallowing is difficult from the pressure of the swelling on the throat, and but little food can be taken. The tongue is furred and swollen, and the breath has an unpleasant smell. Occasionally during the course of the disease, but generally at its subsidence, a similar swelling may affect the breasts or the testicles.

Treatment. If mumps is severe, causing difficulty of swallowing or of breathing, leeches to the part may be required;

but usually hot fomentations will be sufficient (see Chapter XX). During the intervals of fomentation the parts should be wrapped in flannel. The patient should be debarred for a few days from meat; and the aperient draught (Prescription No. 27) should be given as purgation is most beneficial. Rest and quiet should be enjoined. If the inflammation affects the breast or the testicle, the treatment proper for inflammation of those parts should be employed. The patient should be isolated.

PLAGUE

Plague or pestis, in Hindustani called 'taon,' is now an endemic disease of many parts of India. The disease has been known from earliest times, and appears to have visited India in epidemics about once in seventy years. It reappeared last in India in 1895, and since then, owing perhaps to altered conditions and improved communications, it appears to have come to stay. Under the name of 'mahamari,' plague has long been endemic in the Himalayas. Plague is really an infectious disease in rats, its appearance in man is only a secondary phenomenon. There is usually an interval of about a fortnight between its appearance among rats in a place, and the human epidemic in the same place.

Plague is due to a bacillus and this bacillus is conveyed from rat to rat, or from rat to man by means of the rat flea. The most important rat flea concerned with plague is known as *Xenopsylla cheopis*, but many other species of fleas may act as transmitters, including the human flea. Both sexes of fleas can transmit. The bacilli circulating in the blood of the infected rat are taken up, mixed with blood, when the flea bites and feeds. In some of these infected fleas the bacilli multiply in such a way that they produce blockage of the gullet. The flea can no longer suck properly but tends to vomit when it has drawn only a little blood. This regurgitated blood, mixed with some of the bacilli from the mass in the flea's gullet, may thus be injected into the animal or person being bitten. Unless there is immunity, the bacilli then increase in number and symptoms of plague follow. The 'blocked' flea is probably the usual source of infection but the fæces of an infected flea, or material from a crushed infected flea, may occasionally be scratched into the skin. The mouth parts of any biting insect might be responsible for mechanical transfer of infection on rare occasions.

The lymphatic glands nearest the infected bite enlarge and these form the bubo of bubonic plague. One man is not infectious to another unless he carries on his person or clothing infected fleas. There is an exception to this rule in pneumonic plague which is infectious from man to man by means of the bacilli in the sputum. Pneumonic plague is, however, very rare in the plains of India, although it causes devastating epidemics in other countries particularly Manchuria.

It is evident that the study of both the rat and the rat flea are of the greatest importance in framing measures against this disease; but space prevents us from mentioning more than a few salient facts in connection with them. All rats are not equally affected. *Rattus rattus*, the long-tailed house rat, is the rat principally concerned in plague dissemination in India. *Rattus norvegicus* or *decumanus*, the sewer or ship rat, is common only in the seaports and also suffers from plague, but this rat is not so domestic in its habits and therefore does not come into such close contact with man. Squirrels, bandicoots, certain field rats and monkeys may also be attacked by plague. Musk rats, however, are immune, at least in Bombay, and as they are enemies of the house rats they should not be disturbed.

The rat flea can transmit infection for about five to twenty days after feeding on an infected rat, and starved fleas may carry infection over a longer period, especially in colder countries. *X. cheopis* can jump about six inches horizontally and about four inches vertically; so that, if one has to sleep in an infected room, one should be safe to sleep in a hammock if the suspension ropes are tarred, or to sleep in a bed surrounded by Tanglefoot papers. If one visits plague patients it is preferable to do so by day, because the flea avoids the light and is more active in the dark. The incubation period of plague is usually three days, but may be as long as ten.

The onset is usually sudden, the temperature rapidly rising to 103° or 104° F., the pulse and respiration being also rapid. The usual accompaniments of fever are present, such as headache and pains all over, and there is often vomiting and diarrhoea. In only a few hours the disease is at its height; the eyes are then bloodshot, the nostrils dilated, and the face has an anxious or terrified expression. The spleen is always somewhat enlarged.

Most cases of plague are bubonic; and in them the enlarged

glands, either in the groin, the armpit, or the neck, according to the site of the infected flea-bite, appear in the first twenty-four hours of the disease. Pain and tenderness usually attract attention to the buboes, but pain is not essential. The disease lasts from seven to ten days and then the temperature in favourable cases falls gradually. Not infrequently the buboes suppurate, and then the temperature will rise again.

Some bubonic cases are 'ambulatory,' which means that the infection is so mild that the patient walks about with the disease in him.

Other varieties of plague are the septicæmic and pneumonic, which are both extremely grave. The latter variety begins very like ordinary pneumonia, but the sputum is always bloody, and under the microscope the plague bacilli can be seen.

The buboes of plague have to be distinguished from buboes due to other causes, such as venereal disease, or septic wounds in the areas drained by the lymphatic glands affected.

The fatality of plague varies; at the beginning of an epidemic the mortality is high and falls off towards the end. Of fatal cases, 75 per cent. die before the sixth day.

The *treatment* of plague should be both specific and general. If any plague serum, such as Yersin's, is available early in the disease, it should be injected at once.

Besides the general treatment common to all fevers, particular attention should be paid to the heart, as many deaths are due to unexpected cardiac failure. The patient must be kept lying down in bed, and not allowed to sit up for any purpose. Tincture of digitalis, 5 minims four-hourly, may be given as a heart stimulant; and brandy, half an ounce every four hours, will also very likely be necessary. Cold applications should be put on the buboes, if they suppurate they should be incised. It is also a good plan to paint them freely with tincture of iodine from the start.

The Prevention of Plague.

The only measures of permanent value in the prevention of plague is rat proofing, especially the covering of refuse. Rats require food and shelter. Deprive them of these and they must migrate or die out. This entails the erection of well-built houses, separation of shops and stables from human habitations, and the use of building materials and methods

which offer no harbourage for rats. Rat proofing of grain stores is particularly necessary. Rats can jump at least 25 inches vertically and can span at least one foot. A smooth faced wall three feet high with a projecting ledge one-and-half feet wide will keep out rats, provided there are no steps or nearby buildings or objects from which the creatures can reach the ledge or superstructure. Rats cannot burrow in loose sand and two-foot layer of this under the cement floor will prevent access from below. People must be educated to store their food and to dispose of their refuse in such a way that they are not available for the rat population. A good argument for the people is the enormous loss from damage to food and property which rat infestation entails. It actually pays to keep down rats. Complete success in this direction will not, however, be attained until every member of the community does his share.

The measures of temporary value in plague prevention are (a) Evacuation, (b) Disinfestation, or rat and flea destruction and (c) Inoculation.

(a) Evacuation to be effective must be carried out early and completely. It has, however, certain drawbacks. Many people are infected, not in their homes, but in workshops, offices and other places. Again, infection may be spread by persons who, instead of entering plague camps, remove their families and belongings to friends in uninfected villages. Incidentally the panic associated with plague mortality is added to when evacuation is decreed.

(b) There is no more efficient destroyer of rats than plague itself. Trapping is carried out in many places but has not been successful in reducing the rat population except very temporarily. Rats are extremely prolific and even if a number greater than the human population be trapped in a year, there may be just as many rats as before at the end of that time. According to French authorities trapping catches more males than females and breeding actually increases. One trap per fifty inhabitants may be set daily. The 'elongated improved Wonder trap' is the best and the most tempting baits must be ascertained locally.

Poisoning by chemicals or by dissemination of bacterial disease through the medium of baits has also been disappointing in its results. It is a comparatively expensive measure and is usually carried out only for a short time. Rats soon become both trap-wily and bait-wily. The best poison is

Barium carbonate in doses of three grains per bait, mixed with dough made from the common grain of the district. This is harmless to domestic animals and to children.

It is a common practice to treat dwellings in which rat-falls or plague cases have occurred with some sort of spray to destroy fleas. The value of this measure is limited by the fact that sprays of the 'Flit' type do not affect fleas hidden in burrows or crevices or under rubbish. The proprietary preparations are expensive for use on a large scale and an emulsion of soap and kerosine is often used. Sun disinfection of grain and the exposure of grain in hot air chambers to destroy plague infected fleas are now known to be unreliable measures.

Some authorities have argued that trapping and poison baiting after plague has broken out merely lead to an increase in the number of wandering fleas and a greater likelihood of man being bitten. This has led to the development of methods which destroy both rats and fleas. Hydrocyanic acid is one of the most efficient substances for this purpose, and in the form of Cyanogas has been successfully applied to rat burrows in plague infected villages in the Kumbum valley, Madura, South India. With intelligent supervision there is no danger to human beings. Cyanogas is in powder form and, blown into burrows with a special pump, is highly lethal to rats and fleas. There are a number of similar products capable of releasing cyanide gas and in other countries Chloropicrim and Sodium fluoride are used for the same purpose.

Plague Inoculation.

(c) The advantage of inoculation lies in the fact that it is a measure of personal prophylaxis. It matters little who else does or does not co-operate in the measure, those inoculated at least are safe. It is a measure which can be easily and cheaply carried out once a year. A guarantee can be given that at least six times the saving of life will be effected among the inoculated as compared with the uninoculated. When inoculation is more extensively adopted, an even greater saving of life may be obtained. An example of this can be given from some recent figures. The city of Baghdad was attacked by plague in the beginning of 1919 and inoculation against the disease was begun in the middle of January. By the end of May the whole town was infected, and in the week

ending May 30 there were almost equal inoculated and uninoculated populations. Since the two populations are equal as well as the exposure to infection, we may therefore compare directly the numbers of the attacked in the inoculated and uninoculated. From this time to the end of the epidemic the cases and deaths were :

Inoculated cases	.	.	.	.	.	10
" deaths	.	.	.	.	.	4
Uninoculated cases	.	.	.	.	.	226
" deaths	.	.	.	.	.	186

These figures show the protection conferred by inoculation to be twenty-two times against attack and forty-six times against death. With such a degree of protection an epidemic that would produce 1000 deaths in an unprotected population would be reduced to twenty two deaths by inoculation. In addition to these convincing facts, there is a further consideration : every case which is saved from the disease affords man less opportunities for the disease being imported into fresh localities by friends who would have come from other towns and villages to attend the funeral ceremonies. Moreover, inoculation instils into those who undergo the operation that confidence which is so necessary in averting a panic. When the majority in a village are inoculated, the epidemic assumes such moderate proportions that it can be dealt with easily, and it is possible to adopt measures to prevent the spread of infection to adjoining areas. Inoculation checks the spread of plague, directly by lessening the number of attacks and reducing the mortality from the disease, and indirectly by quelling panic and thus reducing the chances of importing the disease into uninfected places.

But, perhaps, the strongest argument in favour of inoculation as an anti-plague measure is found in the steadily increasing popularity of the measure. This is now a well-tried remedy which has withstood the test of time.

The symptoms caused by inoculation commence, as a rule, in three to five hours, and consist chiefly of swelling and pain at the seat of inoculation and of a rise of temperature. Pain is much increased by the taking of alcohol, or on movement of the part, so this had better be avoided for thirty-six hours after the operation. The fever is accompanied by the general discomfort usual to this condition, and no treatment of symptoms is required beyond taking some rest. General symptoms subside after twenty-four to thirty-six hours as

a rule ; if not, a purge will give relief. The pain at the seat of inoculation lasts for three or four days disappearing gradually but a painless induration may remain for some little time. The fluid acts differently on various people, and a uniform reaction cannot be obtained, fever being almost absent in some cases. It is not known whether there is any relation between the presence of high temperature after inoculation and the degree of protection acquired thereafter by the individual, so an absence of reaction does not mean that the inoculation has not 'taken,' as would be said in similar circumstances after vaccination for smallpox.

It is sometimes objected that inoculation makes a person more susceptible to infection for the first few days. This is not correct. Experiments show that there is no 'negative phase.'

The usual dose of the plague vaccine issued from the Haffkine Institute, Bombay, is 4 c.c. for a man (1 c.c.=17 minims). Less is given to a child ; thus a child up to one year of age will take one-twenty-fifth, and a child of one to two years will take one-fifth of a full dose. At the age of six he will take about half a dose.

Children stand the treatment well, and no fear need be felt in giving those doses.

Persons over fifty years of age and all women should be given one-tenth less than the full adult male dose. Pregnant women may be inoculated up to the seventh month inclusive, without making any special reduction of dose. After the seventh month the dose is best given in two instalments, at intervals of a week. Miscarriage has never been known to result from inoculation : and the danger from plague to lying-in women is so great that a special effort should be made to induce pregnant women to be inoculated.

Persons suffering from fever should not be inoculated till forty-eight hours after the fever has entirely gone.

With the exception of persons suffering from fever and those obviously ill from any cause, all can be inoculated. No harm has been produced by inoculation of persons suffering from chronic diseases as rheumatism, diabetes, &c.

PNEUMONIA

Pneumonia may be caused by several different organisms but is usually due to one called the pneumococcus.

Pneumonia begins suddenly with a severe chill and high fever, often with vomiting. Soon there is pain in the side, often severe, and a short, dry painful cough is the rule. The respirations are much increased in frequency; so is the pulse, but not so much in proportion to the respirations. There may be little or no spit, but commonly there is some, soon becoming thick and stained with blood. This coloured sputum is a feature of pneumonia in adults, and distinguishes the disease from bronchitis. Pneumonia may be painless, but nearly always the piece of pleura over the inflamed lung is also inflamed, and this pleurisy gives rise to much pain. The pain may not be felt over the inflamed part, but may be referred lower down, even to the navel (see Chapter III on Pain). The temperature remains constantly high, 104° or 105° F., and the patient may be delirious, especially at night, and the general condition will remain much the same until the fifth to eighth day, when in a favourable case the temperature, pulse, and respiration will fall suddenly by crisis to about their normal, and the patient will feel much better. Bear in mind, however, that the crisis leaves the patient very weak, and he must not stir or be disturbed at this time. The fall of temperature is in some cases delayed several days and may then occur gradually. In unfavourable cases the temperature remains high, the patient from delirium passes into stupor and death.

The *diagnosis* of pneumonia in a typical case is easy even to the layman. The sudden onset, high fever, hurried breathing, and pain in the side form a characteristic picture.

The *treatment* of pneumonia is typically expectant. Pneumonia once started has got to run its course, and that cannot be shortened by medicines. What the patient requires is good nursing, and careful attention to his needs and pressing symptoms. The same treatment and diet recommended for fevers generally should be adopted. It is well to give the patient a preliminary dose of the Aperient Draught, Prescription No. 27, an ounce and a half for an adult. But for the average case no medicines at all are required, only nursing. Do not give the patient expectorant cough mixtures with the idea of helping him to bring up his spit; they will probably do more harm than good. Do not give drugs to reduce the temperature, such as phenacetin, antipyrin, antifebrin. And do not give chloral to promote sleep at night. Certain symptoms, however, may require treatment. For the pain in

the side hot poultices of any convenient material are beneficial they do not shorten the disease, but they relieve the pain, and for this purpose may be applied frequently. Frequent sponging of the body gives relief, especially if the temperature be high. If the temperature goes over 105° F., the patient should have a coldpack (see Chapter XX). If delirium be violent the patient must be carefully watched, especially at night, as then he is inclined to leave his bed and wander. For violent delirium a hypodermic injection of morphia, $\frac{1}{4}$ grain, given as described in Chapter XX, is the best remedy. Brandy, from two to four ounces, should also be given at night in very delirious cases; half an ounce at a time in a little milk. Brandy is also to be given for heart failure, which is especially to be watched for at the crisis. Prescription No. 38 is also useful as a stimulant at such times and may be given in addition to the brandy. If no brandy is at hand, whisky may be used.

Be sure not to have the patient in a hot and stuffy room the pneumonia patient requires fresh air more than any one else. The windows of the sick-room should be kept open and in warm weather patients do better if kept on the verandah.

After convalescence has set in Prescription No. 52 should be given thrice daily till strength is restored. Some special points in the nursing of Pneumonic patients are given in Chapter XIX.

RELAPSING FEVER

Relapsing fever is due to infection by a small organism called a spirochæte, which is conveyed from the suffering to the healthy usually by means of the body-louse. To some parts of the world infection may be conveyed by some species of tick; this variety of infection may be seen in Persia. It will be understood therefore that the disease is found only amongst the uncleanly or those in contact with them; it is more than usually prevalent in times of distress, and this fact has earned it one of its names, 'famine fever.'

Relapsing fever does not often occur in Europe, in India it is not uncommon, epidemics at times occurring in certain areas. The disease commences with a chill, and the symptoms are headache, pain in the back and limbs, and a high temperature. The temperature may be about 104° F. and may be accompanied by delirium. In some epidemics jaundice is common.

After about five or six days the temperature falls suddenly by crisis, and the patient feels much better.

The chief characteristic of this fever is explained by its name; the fever relapses after a period of about six days without fever. There is then a second attack like the first, usually somewhat shorter. After this another period free from fever, then there may be another, and even another relapse. During the paroxysms of fever the spirochæte can be seen in the blood with the aid of the microscope, and on this the diagnosis of the disease depends. It is absent from the blood during the periods without fever. The disease is not very fatal; about 6 per cent. of those attacked die, but epidemics vary in virulence. There is a specific treatment for relapsing fever, consisting in the intravenous injection of salvarsan or a similar arsenical compound. This treatment will cut short the fever at once and will prevent a relapse occurring. An intravenous injection, however, can only be given by a doctor and the assistance of one should be secured as soon as possible. In the absence of medical aid the treatment recommended above for fevers generally should be adopted.

The prevention of relapsing fever consists in the destruction of lice. Not only the clothes and body of the patient, but those of the people with whom he has been living, should be thoroughly disinfected (*see* Chapter XXII). Special attention should be paid to the hair, which should either be shaved or very closely cropped. Those who come in contact with lousy people when relapsing fever is about should protect their bodies with oil emulsion, vermijelli, or one of the other recognised insecticides. Read here the section on Lice on page 387.

RHEUMATIC FEVER

Although rheumatic fever or acute rheumatism, as it is sometimes called, is not infectious in the ordinary sense of the word, it is yet due to some infective agent or germ. It is less common in India than in England.

Rheumatic fever is more common in the young than the old, and is liable to follow a wetting or exposure to cold. One attack of rheumatic fever renders the subject more liable to subsequent attacks. The disease is characterised by inflamma-

tion of some of the joints and of some of the fibrous structures of the body. It usually begins suddenly with fever up to 102° or 104° F. : pain in one or more joints, and often a sore throat. The pain generally comes on in one of the larger joints, which is highly inflamed, red, and swollen, so that it cannot be moved, and the slightest touch is shrunk from. The inflammation may attack several, or all, of the joints, but more commonly two or three are affected one day, and then others are suddenly attacked, the first joint implicated growing, almost as suddenly, comparatively well. There are also frequent characteristic sour perspirations, which do not afford relief. These perspirations are often accompanied by an eruption of small vesicles, which is caused by the heat and moisture, and is of no serious consequence. The duration of the disease may be a fortnight to three weeks, when complete recovery may occur, or stiffness and pain in the joints may remain.

In childhood Rheumatism is an insidious disease, and its manifestations usually consist of sore throats, vague pains in the legs and arms, often coming on at night, pallor and debility. A child with these symptoms should always be shown to a doctor, as the heart is particularly liable to be affected in these cases and permanent damage to this organ may occur.

Rheumatic fever may have many complications ; the most important are those affecting the heart, either the membranes outside the heart or those inside the heart, or the heart muscle itself, called pericarditis, endocarditis, and myocarditis respectively. The results of endocarditis we see often in the form of valvular disease of the heart, so common a sequel of rheumatic fever. There will probably be no sign evident to the unskilled observer by which the advent of these complications will be known. It is of importance therefore that a doctor should see the patient frequently, as the early detection of a heart affection will lead to its treatment and may prevent a chronic disease of that organ.

In a typical case rheumatic fever is not difficult to recognise, but there are other diseases that show fever and painful swollen joints, though not as a rule in such an acute form as rheumatic fever. Thus subacute rheumatism may resemble Malta fever when the latter is accompanied by joint affections ; or some forms of septic absorption, especially those after childbirth, or sometimes bacillary dysentery are followed

by joint affection. The reader is referred to those diseases for assistance in the diagnosis.

In the *treatment* of rheumatic fever good nursing is important. The patient should wear flannel and should lie between blankets and not sheets. The diet should be milk; Imperial drink, or lemonade and barley-water for the thirst. The affected joints should be wrapped in cotton wool, and handled with the greatest care. If very painful the application of chloroform liniment may give relief, but usually aspirin in ten grain doses thrice a day will be found sufficient or Prescription No. 58, an ounce every three hours till pain is relieved, then three times a day.

During convalescence Prescription No. 52 an ounce three times a day. The patients should stay in bed about six weeks, and in the event of a heart complication for longer. It is essential to summon medical aid to advise on each case in such event. Some special points in the nursing of Rheumatic Fever are given in Chapter XIX.

SAND-FLY FEVER

Sand-fly fever, sometimes called 'phlebotomus fever' or 'three-day fever,' is conveyed by the bite of a minute midge



FIG. 13. Common Sand-fly: many times enlarged.

popularly known as a sand-fly. The scientific name of the commoner species of this insect is *Phlebotomus papatasi*: hence another name for the disease is 'Pappataci fever'. This fever is common during the spring and autumn in the Punjab and other areas where sand-flies abound, and is especially likely to attack newcomers.

The incubation period after the sand-fly bite is from four to seven days, and the fever that follows is short and sharp. It usually lasts only three days; but there may be subsequent lesser rises about the fifth or tenth days. On the first day a temperature about 103° F. may be reached and from that time the temperature gradually declines. There is always intense headache and often pain at the back of the eyes, sometimes pain all over, especially in the back. The face is flushed and the eyes often bloodshot. The patient may look very like one with influenza, but there is no catarrh such as often occurs with influenza. The pulse is slower than with most fevers.

The patient recovers, but often remains weak and depressed for many days. Too early a return to work is therefore not advisable, and often a short holiday is a good thing during convalescence. There is no special treatment for sand-fly fever. Quinine may make the headache worse: ten grains of aspirin is more likely to give relief.

A newcomer to a sand-fly area will probably be attacked before long; but protection may be obtained by the use of a sand-fly net at night. This net contains twenty-two holes to the linear inch, while the ordinary mosquito net has only about sixteen holes to the inch. The sand-fly net is therefore somewhat stuffy to sleep under in the summer. The newcomer should ask an old resident to show him a sand-fly, so that he may recognise his enemy when he sees him.

SCARLET FEVER

Scarlet fever or scarlatina is an infectious fever common in Europe, but rare in India. The infection of scarlet fever is conveyed both from the throat and the small flakes of skin of a patient, so it will be understood how small particles from either of these can adhere to a letter or a similar article and carry infection to long distances. Those affected are usually children or young adults.

The incubation period is about three days, and the disease begins suddenly with shivering and frequently with vomiting.

The chief characteristics of scarlet fever are the rash and the sore throat. The rash comes early, first as small red points, which run together and give a red blush all over. This is well seen on the face, which appears flushed except for a pale area round the mouth. The rash lasts till about the fifth day, then gradually fades, the skin afterwards beginning to peel off. This latter phenomenon is called desquamation. The sore throat appears very red over the tonsils and back of the pharynx; white patches may also be seen. The glands in the neck enlarge more or less in proportion to the severity of the throat.

The fever beginning with the onset may reach 105° F. and gradually decline, lasting about a week. A not infrequent complication is inflammation of the kidney, evidenced by the presence of albumen in the urine. The chief points by which scarlet fever may be diagnosed from measles and German measles are given under the former disease.

The *treatment* of scarlet fever should be on the lines of the treatment for fevers generally, with especial care in addition to avoid chills or dampness that may promote inflammation of the kidney. For this reason the room should be warm, though well ventilated, the diet be milk, and the patient kept between blankets and not sheets once the temperature has fallen.

The patient should be encouraged to drink, and the Imperial drink (*see* Chapter XXI) is suitable for the purpose also barley-water.

For the sore throat the patient if old enough should gargle with Prescription No. 21 several times a day. If the throat is very foul, and in any case for a child, much benefit may be obtained by syringing the inflamed area, using a glass syringe and equal parts of chlorine water (Prescription No. 45) and hot water. This should be done every three hours; if the child appears choking use ice-cold water instead of hot water to mix with the chlorine water. A common complication is inflammation of the middle ear. If earache occurs, the procedure recommended in Chapter XII should be adopted.

Remember that the patient remains infectious a long time after he appears well, and must therefore be isolated. In ordinary cases he should be in bed for three weeks, and then, if the weather is dry, allowed up; but not out and about till the skin is quite free from flakes and the throat quite well.

SMALLPOX

Smallpox is an infectious fever characterised by a typical eruption. This disease is extremely infectious throughout its whole course from its initial symptoms up to the end of desquamation. Few unvaccinated people are insusceptible, and must contract the disease on first exposure to it. Smallpox is especially prevalent in dry weather, and ceases during the rains.

Infection may be conveyed by patients or by the dead, or by infected articles such as clothing. The incubation period is about twelve days.

Smallpox begins suddenly with fever and the usual signs that accompany a raised temperature. Sometimes there are rashes, usually of a general red colour, and especially about the lower abdomen and groins : such rashes usually fade with the onset of the typical smallpox eruption.

There is often vomiting, always headache, pain in the back and loins, and occasionally sore throat. Then fever sets in, the pulse becoming quick, and the skin hot, the temperature perhaps rising to 104° or 105° F. If now the finger is pressed on the forehead, a shotty feeling may sometimes be noticed before the eruption is visible. After two or perhaps three days, an eruption of raised red spots appears on the face and forehead, and this is attended with temporary diminution of the fever, the temperature falling to 101° to 102° F. On the third and fourth days the eruption spreads over the body ; on the fifth day each pimple becomes a vesicle with watery head, round base, central depression, and inflamed margin. This central depression is fairly characteristic, and helps to distinguish the malady from chicken-pox. During the next three days 'matter' forms in the vesicles, and they are more prominent. When 'matter' has formed, the peculiar and unmistakable smell of smallpox is present. If the case is severe the face is much swollen, and the eyes are closed by the swelling. About the tenth day the pustules, first on the face, later on the hands and feet, begin to dry up, and about the fourteenth day they form scabs ; these fall off from the twenty-third day, leaving the skin of a reddish-brown colour. Frequently scars or 'pits' are left by the healing of the pustules. As the eruption attains its height the fever generally shows considerable increase for two or three days, the temperature again rising to 104° or 105° F., this is called the

'secondary fever' of smallpox, and usually occurs on or about the eleventh day, which is the period in bad cases of the greatest danger from exhaustion. The tongue is furred, white throughout, and sometimes swollen. In adults the bowels are most frequently constipated during the whole time; in children there is frequently diarrhoea at the commencement.

In very bad cases the pustules are so thick that they almost or quite join; the disease is then said to be confluent. In such instances the fever is much more severe, there is delirium and the patient may die. About half the confluent cases die.

The eruption may also appear in the nose, eyes, or mouth, and in the larynx.

There are very severe types of the disease where bleeding occurs under the skin or elsewhere, known as hæmorrhagic smallpox.

After effects are not uncommon, the most frequent being boils or abscesses.

Smallpox is called 'modified' when it occurs in a previously vaccinated subject. Though the fever may be in such case begin with its usual virulence, the disease tends to run an altogether milder and shorter course.

Diagnosis. There is only one disease that may be commonly confused with smallpox, and that is chicken-pox. And this confusion is only likely to occur when the smallpox is particularly mild. The main point of distinction is the distribution of the rash, which in smallpox tends to be so much more on the face and extremities. Though these areas are by no means free in chicken-pox the eruption here tends to be more evenly distributed over the trunk as well. Some of the points of distinction are tabulated on p. 103.

Treatment. The patient must be isolated, if possible in a separate building. It is best to erect a 'chhapper' hut in the shade of a tree and at some distance from other dwellings. Afterwards the hut and its contents should be burned, including all clothing that has been in it.

The treatment recommended for fevers generally should be adopted, and, though there is no specific cure for the disease, some benefit may be derived from the administration of pulv. hydrargyri cum creta, 1 grain three times a day.

The great essential is cleanliness, and unless that is adequately carried out the patient will not only smell horribly, but may die of septic complications. He should be washed daily with an antiseptic lotion, one part of Prescription No.

16 to two of water ; and it is good to make the patient a mask of lint, with small eye, nose and mouth holes, and to keep this mask moist with the lotion and constantly on the patient.

	Chicken-pox	Modified smallpox
Incubation .	Thirteen to sixteen days.	Twelve days.
Premonitory fever .	A few hours.	Two or three days.
Premonitory symptoms .	Mostly nil.	May include headache, backache, drowsiness, vomiting, delirium, convulsions.
Rash . .	Red spots becoming vesicular in a few hours and drying up in three or four days, leaving crusts ; coming out in crops on four or five successive days on the scalp, trunk, limbs, face, and mucous membranes. The vesicles are mostly unilocular.	Red shot-like papules appearing on face, wrists, body, limbs, and soft palate ; in the course of a day or two the papules becoming vesicles, and developing into pustules by the eighth day, or they may dry up, leaving only scabs.
Temperature .	Intermittent in character.	Sudden rise, reaches its height when the papules are fully out ; then comes a speedy fall. The secondary fever is slight or absent in modified cases.

Prominent pocks may be pricked, or if already burst, dabbed with this lotion. This will be found to relieve the intolerable itching.

The eyes should be kept clean with boric lotion, Prescription No. 14.

When the pocks begin to dry, the free use of vaseline, especially on the face, will be of use not only to the patient, but to prevent the scabs blowing about.

Constant attention and the free use of the carbolic acid lotion can do much to relieve the pitting resulting from small-pox.

VACCINATION

Smallpox may be prevented or profoundly modified by vaccination. Vaccination means giving the subject 'cow-pox,' which is really a mild and greatly modified form of smallpox.

Vaccination produces no ill effect, and yet the person who has been vaccinated may be as much protected against smallpox as if he had had that disease. If the latter affection is taken after cowpox, which sometimes happens, it is always mild, scarcely ever leaving any injurious results on the constitution. Experience and statistics show that vaccination protects the individual and greatly diminishes the amount of smallpox in the community. The vast majority of ailments which have been ignorantly attributed to vaccination have no possible connection with it.

Vaccination should be performed in infancy, again about the age of seven, and at similar intervals thereafter. Healthy children should be vaccinated within three months after birth and, when smallpox prevails, at a much earlier period. If, however, a child suffers from disordered bowels, or from eruptions of the skin, or is weakly, and there is no smallpox about, it may be desirable to postpone the operation. In India the cold season is the best time for vaccinating.

On the second day after vaccination a small red spot may be observed at each scratch of the lancet. On the fifth day there are circular pearly vesicles containing a limpid fluid. On the eighth day these are fully developed, the centre of each being depressed, with an inflamed red ring around, of the breadth of from one to three inches. There is probably slight fever, often some swelling of the arm, and sometimes enlargement of the glands in the armpits. On the eleventh day the pustules burst, leaving a scab. About the twentieth day the scab falls off, leaving permanent scars or pits. If these symptoms (excepting the enlargement of the glands in the armpit) do not present, particularly if the red ring or *areola* is not well developed, the operation is not successful, and confers no protection.

During the progress of the vaccine pustule great care should be taken lest the child rubs or scratches the part. If this occurs there may be a troublesome sore, and much redness about the armpit. Under such circumstances it may be necessary to apply a hot fomentation until the sore is clean

and healthy, after which boric ointment (Prescription No. 82) is the best application. Shields have been devised for the protection of the part, but they are not necessary.

TYPHUS FEVER

Typhus fever may be conveyed to men by either of two insects the louse or the tick and probably fleas and mites. There are some differences in the disease according to which insect conveys the infection and the two types are referred to as louse-typhus and tick-typhus. Louse-typhus is the commoner and better known form of the disease and when the term typhus fever is used without qualification the louse-borne form of the fever is meant. Tick-typhus, though not very common, is comparatively wide-spread in India, and has been found from the Kumaon hills to the Madras Presidency. Tick-typhus is usually a less severe illness than louse-typhus. Louse-typhus is ordinarily found in times of peace only amongst the uncleanly and those who come in contact with them; but under conditions of active service during cold weather the louse may be a danger to all classes.

The lice lurk in the clothing and bedding of the patient as well as on his body and are always waiting to creep to new pastures. This explains why so many cases of typhus occur amongst doctors and nurses, whose work brings them very close to the sick.

Louse-typhus is fortunately not common in India, but does occur. After the louse-bite the fever takes about twelve days to incubate, then usually begins suddenly with a chill and severe body and head pains. Fever is high and remains high for about fourteen days, when it ceases suddenly by crisis. About the fourth or fifth day a rash of dirty pink spots appears on the sides of the chest, the inside of the upper arms, the wrists, and then abdomen. But this rash may be slight and hard to make out on a dark skin. Sometimes, and in tick-typhus this is the rule, the rash may spread over the whole body including the extremities and may consist of bright red spots which take several days to fade. The face is flushed and the tongue dry and usually brown. Violent delirium is common, followed about the tenth day by great weakness. The patient may lie in an unconscious state for days and then die, though recovery is the rule. Usually there is some bronchitis during the fever.

There is a special blood test, called the Weil-Felix reaction, used to diagnose this disease. The treatment is that for fevers and delirium generally. Brandy, especially at night, two or three ounces is often required. Other cardiac stimulants may be given hypodermically by the physician.

Especial care must be taken to prevent infection of others : the section on Lice on p. 387 should be read in this connection.

WHOOPIING-COUGH

Whooping-cough is an infectious catarrh of the respiratory passages accompanied by slight fever. It usually attacks children between the ages of two and seven years, but may attack adults. One attack usually gives immunity. The incubation period is from a week to a fortnight. Whooping-cough commences as a common cough, but after some days the cough comes on in 'fits,' after which the breath is drawn in with a long effect, and accompanied by a peculiar 'whoop.' In bad cases there may be twenty paroxysms in a day, several fits of coughing without the whoop being heard. A child with whooping-cough soon learns when the paroxysm is commencing, and is frightened. He rushes to the mother or nurse ; or, if of a more advanced age, stamps his feet in a state of agitation, and clutches some article of furniture by which to steady himself. Vomiting frequently attends the fits of coughing, and the suffocation of the child may appear threatened, when suddenly the characteristic whoop is heard, which terminates the paroxysm, and the child returns to its play. From the vomiting children with bad whooping-cough sometimes cannot retain sufficient food in the stomach to supply the wants of the system, and may suffer from starvation. Simple whooping-cough is rarely fatal ; but unfortunately whooping-cough may excite other maladies. The force of the cough may cause bloodshot eyes, bleeding from the nose, or from the ears, and sometimes rupture of the drum of the ear. In most cases there is some degree of bronchitis attending the complaint, shown by hurried breathing, feverishness, and by wheezing heard in the chest. In some cases inflammation of the lungs (broncho-pneumonia) is induced (*see* p. 146). In other instances, from injury to the air cells from the force of the cough, the foundation of emphysema is laid (*see* p. 168). Convulsions may also be excited, the approach of which is indicated by contractions of the fingers or toes, or by turning in of the thumb to the palm of the hand.

As with measles, so with whooping-cough, the great danger is not in the disease itself, but in its complication, broncho-pneumonia. The reader is referred to the section on broncho-pneumonia in children. Mothers should be careful not to allow their whooping children to come in contact with other children.

The disease lasts about six weeks as a rule, but may last months, during the whole of which time the child is infectious.

The *treatment* of whooping-cough should be on the same lines as that of measles, to which section the reader is referred : except that it is not necessary to sponge the patient frequently. For the catarrh give two drachms of Prescription No. 75 four times daily to a child of two or three years. If the fits of coughing are troublesome, give to a child of that age two drachms of Prescription No. 72 when an attack comes on, but not more often than five times a day.

The inhalation of a 1 per cent. solution of formalin in hot water may also be tried. If broncho-pneumonia supervenes treat as under that section. On recovery give the child a change of air to the hills or seaside. Good results have also been claimed from the use of ultra-violet rays in whooping-cough.

YELLOW FEVER

Yellow fever is not known in India, but is an infectious disease of other tropical countries, prevailing especially on the Spanish Main. It is transmitted by the bite of a particular mosquito, *aedes aegypti*, of which mention is made again in the section about mosquitoes with reference to the prevention of malaria. Since this mosquito is found abundantly in India and Ceylon fears were expressed formerly that improved communications with the New World *via* the Panama Canal might infect our mosquitoes also and introduce the disease to India. This has not occurred, but a fresh danger has arisen in the establishment of rapid aeroplane communication between Africa and other countries. Many African natives have suffered from yellow fever in a mild form whereas in Europeans the attack is usually severe.

The incubation period is three to five days. Yellow fever ordinarily commences suddenly with shivering, followed by fever. There is constipation, much headache, troublesome vomiting, tenderness at the pit of the stomach, redness of the eyes, and pain in the back and limbs. On the third or fourth

day the symptoms subside, and the person may recover. But most frequently the stomach tenderness returns and black vomit sets in, *i.e.*, the vomit contains blood, the 'stools' being dark from the same cause. Jaundice also occurs, and the patient sinks into the typhoid condition.

The *treatment* should be on the lines of that for fevers generally.

Prevention. A recent discovery is that protection against yellow fever can be given by a few injections to a subject who is not immune. It is very advisable therefore that a European who intends to visit an area where yellow fever is rife should previously submit himself to this inoculation

CHAPTER V

DIARRHŒAS

Catarrhal diarrhœa : Food poisoning : Ptomaine poisoning : Cholera :
Dysentery : Hill diarrhœa : Sprue : Tropical diarrhœa.

DIARRHŒA is not a disease but a symptom ; and a proper understanding of this fact will lead to a more efficient treatment of the condition. In other words, we do not aim at stopping the diarrhœa, but at removing its cause, and the cause may be very different in different cases. The first essential is to discover the cause in any particular case, and the reader should determine which, if any, of the heads in this chapter his case comes under. Usually all the varieties are easily diagnosed except that of catarrhal diarrhœa, and we will proceed to indicate the commoner causes of that first.

CATARRHAL DIARRHŒA

By catarrhal diarrhœa is meant a looseness and frequency of motions due to an inflamed condition of some portion of the mucous membrane which lines the intestines ; in other words, a cold in the bowels, comparable to a cold in the head. Such a catarrhal condition may be merely a part of some more serious disease involving the heart or kidneys or other organs ; but when other organs appear healthy, catarrhal diarrhœa is usually due to one of two causes :

(1) An irritant taken into the intestinal canal with the food or drink.

(2) A so-called chill.

(1) By far the majority of cases are due to an *irritant* ; in fact, many of the cases popularly attributed to chill are really due to this cause. If the irritant is sufficiently strong it will usually act first on the stomach and cause vomiting ; if it passes on to the intestine then the effort the body makes to expel the offending matter is evidenced by diarrhœa. It will be understood therefore that under such circumstances

the diarrhœa is a good thing, and nature should be helped in her efforts to expel the irritant. Such diarrhœa usually arises from an error in diet, and the irritant matter is usually indigestible food, unripe fruits, badly cooked vegetables, shell fish, inferior tinned provisions, inferior wine or beer, &c. Diarrhœa of the irritative type may arise from a dirty condition of, or from defective tinning of, cooking utensils. Brackish or hard water may excite *irritative diarrhœa*. When persons pass from districts where the water is good into localities where it is brackish or hard, they frequently suffer from diarrhœa, especially if no precautions are taken in the way of boiling the water.

Treatment. Nature tends to cure this complaint herself; as already explained, the diarrhœa is her means of treatment; but she should be assisted by an ounce of castor-oil. If there is painful griping, 10 minims of tincture of opium or of chlorodyne should be added to the oil; and turpentine stupes over the abdomen, for which see Chapter XX, will also assist in relieving the pain.

Should the diarrhœa last more than two days, by which time the irritant will have been expelled, and the diarrhœa remaining due to the catarrhal condition left behind, then sedatives and astringents may be given. Three minims of tincture of opium added to an ounce of Prescription No. 42, given three or four times a day, should be successful. Prescriptions Nos. 43 and 59 are also useful for this purpose, one ounce three or four times daily. During the diarrhœa nothing more than milk and barley-water should be taken, and as recovery ensues the diet should be gradually increased to eggs, toast, fish, &c. Do not fly to brandy as a remedy for such diarrhœa; it is a popular fallacy to regard brandy as the remedy for all diarrhœas. Half an ounce of brandy or an ounce with a little milk is useful in allaying the painful gripes; but do not imagine, as so many of the young and inexperienced appear to do, that by taking a brandy peg at dinner instead of a whisky peg, and omitting the principal course, that you are thereby treating looseness of the bowels efficiently.

(2) *Diarrhœa due to a Chill.* This often results from sudden changes of temperature, as occur, for instance, at the commencement of an Indian monsoon, or from exposure to damp night air, or from damp clothing or bedding, or even from sitting before an open door or window, or on the first passing

out into the cold early morning air. Diarrhoea, which has been erroneously attributed to malaria, occurs after a person has been actively engaged during the day, perhaps snipe-shooting, in the heat of the sun. He returns home, feels a little feverish, has diarrhoea during the night, and in the morning feels well again. This depends on chill and fatigue, or unaccustomed exercise. On inquiry it will be found there has been exposure, when fatigued, to the evening fall of temperature, or to a dense shade immediately after the skin has been acted upon by a powerful sun; or the person has been sitting in the wind when perspiring. In any climate diarrhoea may be excited, in a weakly predisposed person especially, on exposure to variation of temperature. This is probably more often the case in India, partly owing to the general tendency to bowel complaints in the East, but chiefly owing to changes of temperature so readily inducing chill on a skin rendered excessively sensitive by heat.

Under such circumstances as the above it is fair to say that the diarrhoea has been caused by a chill. But the chill is usually only a predisposing cause, and some other exciting cause is present in the bowel. Many of these cases are really mild dysenteries and due to the same organisms that cause that disease. The account of dysentery here given should be read. Should the patient find himself subject to recurrence of these attacks of catarrhal diarrhoea from chill, he should have his motions examined for the presence of the amoeba, with a view to treatment by emetine hydrochloride in the manner recommended under dysentery.

Never neglect diarrhoea in the tropics; treat it seriously in its early stages or it may become uncontrollable later. The diet should be as laid down in the preceding section on Irritant Diarrhoea. For medicine, Prescription No. 60 may be taken, one ounce four-hourly. In a mild case one dose of the medicine may be sufficient, if combined with some curtailment of the usual dietary.

FOOD POISONING

Animals whose meat is naturally suitable for food, may by feeding on certain substances, render their flesh poisonous to men. Any food, moreover, may become infected with the germs of some specific disease, such as milk with cholera or

enteric fever. But by food poisoning is usually meant a distinct condition due to other causes than the above. The term 'ptomaine poisoning' has come popularly to be used as identical with food poisoning.

But nearly all cases of food poisoning are caused by the presence of certain harmful bacteria in the food in cases where the cooking has not been sufficiently intense or prolonged to kill them. The food containing these organisms may be either fish, meat, or milk-products such as ice-cream. Stale fish, such as the pomfret that is sent up-country from Bombay and Karachi, has sometimes in the hot weather caused an outbreak of food-poisoning. It is not necessary that meat containing these harmful bacteria should smell badly: there may be no change evident to any sense. It is important therefore to have all meat well cooked in the hot weather.

The symptoms vary somewhat in different attacks of food poisoning; but they agree usually in causing, after a few hours' incubation period, intense irritation of the alimentary tract, giving rise to vomiting, diarrhoea, giddiness, feeble pulse, cold sweats, and the general signs of collapse.

The symptoms may resemble those of cholera, and the diagnosis even to a medical man may be difficult without the aid of bacteriological examination of the stools. One point should be borne in mind, and that is that if a large number of people are attacked simultaneously, the disease is probably food poisoning. But if a few are attacked one day and a few another, some escaping altogether, and the cases being spread over some days, the indication is for cholera, due to some cause of infection that is still acting, and not, like food poisoning, due to the ingestion of poison by all or most at one particular meal.

If the patient be not too exhausted then the stomach should be washed out as described in Chapter XX, and one ounce of castor-oil given. If he be collapsed, then saline injections should be given by the rectum as recommended for cholera. Small doses of brandy in a little water will also be beneficial in such collapse. The source of the infection should be ascertained and the offending food destroyed or sent to a laboratory for examination.

In the milder cases of food poisoning the treatment should be that described on page 110 for the irritant variety of catarrhal diarrhoea.

CHOLERA

Cholera is an infectious disease due to the presence in the bowel of a micro-organism, called a spirillum or comma bacillus on account of its shape.

The home of cholera is Lower Bengal and the Gangetic valley. On occasions when many people meet, as at religious fairs, cholera in the past has been conveyed by a few infected people to others, who departing in different directions to their homes have spread the disease broadcast and so established an epidemic. Thus it is seen that cholera spreads along lines of communication, and has reached in this way Europe and even America. While the more rapid the means of communication have become with advancing civilisation, the more rapid has been its spread in successive epidemics; on the other hand, modern sanitation has coped successfully with the disease, and its presence in civilised countries is now unusual and not of long duration.

In the parts where cholera is endemic, such as Lower Bengal, though present to some extent all the year round, it is most prevalent in the hot season immediately preceding the monsoon, with the onset of which it falls, to undergo a re-crudescence in November, and then fall again to reach a minimum in January and February.

Infection by cholera occurs by contamination of food or drink from the excreta or vomit of a previous patient. It is evident therefore that infection may be conveyed in the ways described under Enteric Fever, where faecal contamination is also the factor. The cholera bacillus is not so hardy as the enteric bacillus in that it will not stand drying, and cannot resist the pressure of carbonic acid gas in soda-water for many hours; so that soda-water may be considered safe if made at least two days previously. On the other hand the bacillus will survive freezing, and so may be present in ice or in ices; it will live on soiled clothes, if moist, and on fruit and vegetables, such as salads. In any widespread epidemic the bacillus is usually found in the water-supply, and by means of water it may reach milk. Or, again, it may stay in an inefficient filter and infect pure water that is being passed through the filter. Flies may convey the bacillus to food; and, as with enteric fever, 'cholera carriers' may harbour the bacillus unknown to themselves and be a constant danger to their neighbours. It is the attendance of such carriers at

religious fairs that has doubtless been responsible for many outbreaks of cholera.

Amongst predisposing causes of the disease are chills and depressing conditions, mental and physical.

Symptoms. The chief characteristics of cholera are the frequent passage of rice-water stools, watery vomiting, early suppression of urine, muscular cramps, and extreme collapse.

The stools are called rice-water because, in their white opalescence with minute floating particles, they resemble water in which rice has been boiled. They have none of the natural bile colour.

Sometimes cholera begins suddenly with passage of such stools setting in very soon and with vomiting; but sometimes there is a stage of diarrhoea before the choleraic stools begin. This diarrhoea may last hours, or even days, and is of importance because vigorous treatment at this stage may effectively check the disease. During any cholera epidemic there are a large number of people attacked with simple diarrhoea. This should be checked at once in the manner described below; once the rice-water stools begin the diarrhoea is entirely beyond control. The 'stage of evacuations' is the name given to the period during which the watery diarrhoea and vomiting are so free. As the fluid passes so freely from the body the appearance of the patient becomes more and more shrunken, the fingers and toes shrivelled, and the eyes sunken. Muscular cramps set in, especially in the legs, and are extremely painful. Before long the patient becomes collapsed, and no pulse may be perceptible at the wrist. No urine will now be passed; and there will be great thirst, which should always be satisfied by drinks of a few ounces at a time, whether the patient vomit them or not. The case may be so mild that no collapse occurs, but usually the 'stage of collapse' now sets in, the patient's voice all but disappears, and the pulse may entirely go, the skin is cold, severe cramps are common, and the patient is restless. In this stage the patient may die; the collapse may last but a few hours; if it lasts more than a day the patient's outlook is grave. If the patient, however, survive so far, the next stage, that of 'reaction,' is entered, and this too has its peculiar dangers which are two in number; first, that the fever, which now sets in, may rise too high, and the patient in his enfeebled condition succumb to hyper-pyrexia; secondly, that the kidneys will be damaged to such an extent that no urine will

be secreted, and the patient becomes poisoned by the waste products that should be excreted in the urine and dies of uræmia. It is therefore of the greatest importance that urine should be excreted freely, as many a patient survives the dangers of the earlier stages of cholera only to die of uræmia at the end. How to obviate, so far as possible, these dangers we will indicate below.

Cholera is a most fatal disease, especially so at the beginning of an epidemic, when about 80 per cent. of those attacked die. After raging for about a month, by which time the most susceptible in a district have already been infected, the mortality lessens and may be about 40 per cent. towards the end.

There is usually no difficulty about the *diagnosis* of cholera during an epidemic. Ptomaine and arsenical poisoning may resemble cholera, but the characteristic signs given above, especially the watery stools, should usually lead to a correct diagnosis. In any small outbreak of diarrhœa the fact that everybody is simultaneously attacked, or everybody who partook of a certain dish or meal, is in favour of some form food poisoning, whilst the illness of two or three only of the number on one day, followed by the sickness of others on subsequent days and the entire escape of some, is in favour of cholera, since by no means every one who eats or drinks cholera bacilli is attacked by the disease. In children diarrhœa may sometimes resemble cholera, but there will be no important difference in the treatment whether choleraic or not. Sometimes the skilled examination of the stools to detect the presence of the cholera bacillus will be the only means of reaching a correct diagnosis.

The *treatment* of cholera may be said to have been put on entirely sound and rational footing by the work of Sir Leonard Rogers, who, between the years 1906-15 in Calcutta, introduced the best palliative method as yet devised for the treatment of cholera and whose reduction of the death rate from cholera in his Calcutta hospital from 59 to 23 per cent. is a splendid achievement. Unfortunately, however, for those who are seized with cholera in places remote from medical attendance, the advantages of Rogers' discoveries are only partly of assistance, since the proper carrying out of the treatment requires skilled medical knowledge for taking blood pressures, estimating the specific gravity of the blood, and administering saline injections. It is exceedingly important therefore, to realize that as soon as symptoms suggestive of

cholera appear, the patient should lose no time in going to a hospital equipped with treatment according to the best methods or to send for the nearest and most efficient medical aid. The course of the disease is so rapid that the successful treatment of patients suffering from cholera entirely depends upon making a most careful assessment of the varying phases of the disease and the application of rational methods of treatment. In no other disease is a closer collaboration between the nurse and the doctor necessary to bring about a cure. In cholera two main lines of attack are essential to counteract the effect of the powerful poisons of cholera on the body, to eliminate the poisons already formed, to destroy the cholera organism and thus prevent further formation of poisons and to heal the damage done to the body. It is essential that the treatment be begun as soon as possible, the symptoms be watched carefully and the treatment be modified as the case develops.

The measures here recommended are such as may be carried out by one without medical training; they cannot for a moment compare with what might be done by a doctor in possession of suitable apparatus. When diarrhoea is prevalent during a cholera epidemic, cholera bacteriophage or choleraphage may be given, one ampoule of 2 c.c. on an empty stomach and repeated two or three times a day. In addition, and if choleraphage is not available, the essential oils mixture No. 61, 5 or 6 times a day may be given. In no case should a purgative be given as this may precipitate an attack of cholera. But the moment the motions lose colour and the stools appear rice-water the disease has definitely developed, and active treatment must be started at once. It is certain that time is an important factor, and whatever medicine is to be given the sooner it is administered the better, because it is only in the early stages that medicines given by the mouth can act well. In the absence of a doctor or until one arrives either or all of the following three substances may be given, whichever is most readily at hand :

(a) Essential Oils mixture.

(b) Kaolin.

(c) Cholera Bacteriophage.

(a) Essential Oils mixture—(Mixture No. 61).—Half a drachm in one ounce of water every quarter of an hour for 2 or 3 hours. Doses vomited should be

repeated. It is a powerful carminative, stimulant and astringent. Six to eight doses of this mixture should however not be exceeded in any one case.

- (b) Kaolin, or China Clay, is given stirred up in water, in the proportion of one part of Kaolin to three of water. It can do no harm and should be taken as freely as possible, about a quarter of a pint every 15 minutes, or more often.
- (c) Bacteriophage or cholera phage is in the experimental stage at present, but reports of its use are encouraging and since it can do no harm, it should certainly be given if obtainable. Cholera bacteriophage is an ultramicroscopic agent that seems to kill cholera bacilli. It may be obtained from the Public Health Laboratory at Patna, from the Pasteur Institute at Shillong and King's Institute, Guindy, Madras. In a case of cholera it should be given as early as possible in doses of 2 cubic centimeters, irrespective of the age of the patient and repeated frequently.

It may be conveniently given in small sips of water, and attention must be drawn to the fact that an ampoule of bacteriophage once opened should be used within three hours of opening and that ampoules of bacteriophage showing the slightest degree of turbidity should not be used.

The patient should be kept in a horizontal position in a warm bed and the foot of the bed raised a little. Nursing is all important, a careful recording of the temperature, including rectal temperature, pulse, reporting the number and character of the stools, seeing that the patient avoids chills and gets adequate attention are essential. The skin should be wiped dry from time to time with a towel. On no account should the patient be allowed to get up to pass urine or stools, but be made to use the bed pan. In very severe cases, the incessant use of the bed pan exhausts the patient's strength and a better plan is to put a waterproof sheet which can be changed every few hours under the patients, and pack the buttocks with tow or cotton wool. It must always be remembered by the attendant that the stools, and often the vomit, are highly infective and should be covered by some disinfectant. Similarly, articles of clothing or bedding, etc., soiled by evacuations should be boiled or soaked in a

disinfectant for some hours before being sent to the wash. It is as well if the attendant wears rubber gloves when washing the patient or changing his bedding. Sips of water, soda-water, barley-water or cocoanut water should be given frequently to allay thirst. No food should be given for the first 24 hours, not even milk.

Cramps may be relieved by friction and massage of the limbs. Of drugs, it may be said that the majority of the drugs which have formerly been advocated for the treatment of cholera are not only useless, but actually harmful. Among these mention may be made of purgatives, opium, acids and intestinal antiseptics; the first three are harmful. Except under direct medical advice no medicines should be given except the three named above. At the same time to combat the extreme loss of fluid from the system by purging and vomiting, rectal injections should be given by means of a tube passed into the bowel. There is no better or more logical means of replacing the fluid lost by the system than the intravenous injection of hypertonic saline or normal saline solution, which is the basis of Rogers' treatment; but as this requires considerable technical knowledge we must resort to the introduction of fluids by means of a long tube into the bowel. The fluid to be introduced should be a solution of common salt, $1\frac{1}{2}$ drachms to the pint of water and this should be run in slowly once every two hours and retained by the patient if possible. Later on, when diarrhœa has ceased, this can be reduced to once every four hours until urine is being freely passed. The temperature of the saline solution should be about normal blood heat, *i.e.*, 98.4° F., do not warm the injection at all, but give it at the temperature of the room. Encourage the patient to take fluids, especially alkaline fluids and libitum by the mouth. About 25 per cent. glucose added to the alkaline drink and also to the fluid to be injected into the bowel will be found useful in combating the development of the serious complication, uræmia.

If the patient survive the stage of diarrhœa and collapse, he then encounters the dangers of excessive fever and of uræmia, already described. If the temperature taken in the rectum is now over 104° F., sponge the patient all over, apply ice to the head, and give an enema of ice-cold saline. If it rises further, cold pack the patient as described in Chapter XX.

For excessive vomiting, retching and hiccough, tincture of

iodine in drop doses may be given or cracked pieces of ice may be sucked. A mustard plaster over the stomach may help.

For difficulty in breathing aromatic spirits of ammonia have been found useful.

Do not be perturbed if some diarrhoea still remains in the febrile stage: it may do the patient good. Certainly do not give him opium now, nor any astringents. At this stage, tincture digitalis 4 min. combined with one ounce of Prescription No. 28, given every four hours, may be of use in promoting the flow of urine. The rectal injection of salt solution with 25 per cent. glucose and sodium bicarbonate (about 1 per cent.) should be continued four hourly until at least two pints of urine are passed in the twenty-four hours. Dry cupping, as directed in Chapter XX, may also be performed over the loins and combined with hot dry fomentation over the lumbar region help to relieve the congestion of the kidney.

When urine is passed freely the patient may be considered convalescent, and fortunately the convalescence from cholera is usually a rapid process. Whey and then milk may be given to drink, in fact the advance to these may be made in the stage of reaction, and gradually thence on to arrow-root, sago, rice until a full diet is reached, leaving soups and meats to the last. Raisin tea is a useful drink throughout the course of the disease.

Means for the prevention of cholera will already have been suggested by consideration of the cause of the disease given above. It must be remembered that in order to spread cholera the cholera vibrio present in the stools or vomit of a cholera patient, convalescent or a carrier, must be conveyed to the mouth of a susceptible person. The agents by which such transference is generally effected are fluids, food, flies and fingers. The boiling of all water and milk, avoidance of raw fruits and raw vegetables during an epidemic, and general cleanliness are the principal means to be carried out. It is also a good practical rule to eat only hot food at such times, since that will have been recently sterilized by the cooking, but it is important to ensure that the cooked food has been efficiently protected from contamination by flies subsequent to the cooking. In addition there is a specific means of inoculation against cholera which should be undergone by those likely to be exposed to the disease in the immediate future.

The inoculation against cholera, if a sufficient dose of a vaccine from a reliable source has been given, certainly affords considerable protection; but as this protection lasts only for some six months or so, it is not recommended except for those likely to come in contact with cholera in that time. Such people should ask their medical attendant to inoculate them with cholera vaccine. Another method for personal prophylaxis is by bacteriophage, but this has the great disadvantage that it is necessary that bacteriophage be taken daily. It confers no lasting immunity; but it is thought to be a valuable agent particularly along with cholera inoculation in the face of an epidemic.

It is probable also that a considerable degree of protection from cholera can be acquired by taking Besredka's bilivaccine, provided the full course of three doses is taken under the conditions prescribed. Bilivaccine can be obtained from several of the larger druggist shops.

DYSENTERY

Dysentery is commonly spoken of as if it were one disease, and as if all dysentery cases were of similar nature; but science now knows that there are at least two kinds of dysentery absolutely distinct in nature and requiring different methods for their treatment. One of these dysenteries is due to a small animal organism called an amœba, the other is due to a vegetable organism, a bacillus. So the two kinds are spoken of as amœbic and bacillary dysentery respectively.

In order to differentiate these two varieties medical skill and the use of the microscope are absolutely necessary. In the event of an attack of dysentery such skilled aid should be requisitioned. The following account is written for those without such aid who are unable to distinguish between the two diseases.

Dysenteries are very prevalent in India and other tropical countries: they are especially prevalent in warm moist climates, such as that of Lower Bengal. Moreover, in the rainy season the amount of dysentery increases, and the frequency of diarrhoea corresponds to that of dysentery, and this is an indication that many of the diarrhoeas are really mild dysenteries, either amœbic or bacillary.

Besides the presence of the amœba or bacillus being neces-

sary for dysentery, and the influence of the climate and season already referred to, predisposing causes of an attack are chills owing to sudden changes of temperature, errors of diet, bad food and impure water, whilst want of food, debilitating diseases, and the stress of active military service are also factors.

The first symptoms of dysentery are feelings of griping about the navel, often accompanied by nausea, occurring after any of the conditions given as likely causes. This is felt after incautious exposure to night air, particularly during sleep, and more especially if the wind has been suffered to play on the abdomen, even if covered. Next there are frequent calls to 'stool' with irregular loose motions which may continue one, two, or three days, forming the premonitory diarrhoea of dysentery. Then the irregular griping pains gradually become worse, with great heat and soreness about the fundament, and frequent straining. Matters now voided consist of liquid fæces, streaked or mixed with white mucus and blood. As the disease becomes more severe, no fæcal matter is passed, only shreds or large flakes resembling the washings of raw meat pass away, and the 'stools' have a peculiarly offensive odour. The desire to 'stool' is generally most urgent during the day; in some instances it is incessant, in others there may be ten or twenty calls in the twenty-four hours; any movement increases this feeling. There is frequent desire to make water. The amount of attending 'fever' is variable, in some instances hardly exciting attention, in others evidenced by a flushed face, dry skin, hard quick pulse, and furred tongue. Pressure over the bowel is painful.

Just as often the onset of the disease is sudden, and griping is attended with the passage of blood and mucus in the first motion. Sometimes dysentery is very acute with gangrene of part of the wall of the bowel, which then appears in the motion as black sloughs. Sometimes, on the contrary, the disease is unusually mild, and may not appear more than a simple diarrhoea. Even such mild cases, however, have their danger, because all amoebic dysenteries are liable to be followed by inflammation of the liver, which may extend to abscess.

Typical dysentery is not likely to be mistaken for any other disease: the only difficulty will be the differentiation of the two sorts of dysentery we have already referred to.

Both kinds of dysentery if neglected may become chronic, and both, therefore, require active measures in their treatment.

Treatment. The treatment should be general, medicinal and dietetic. The patient must certainly go to bed and stay there until he can pass a formed motion without blood or mucus. If seen very early in the attack he should be given an ounce of castor-oil at once; and, beginning three hours later, one ounce doses of castor-oil emulsion, Prescription No. 43, should be given every five hours. If, however, the patient has already had several motions when he comes under treatment, the initial dose of the pure oil may be omitted and the emulsion alone given. Now for amœbic dysentery emetine in some form is a specific, and on the chance that the dysentery may be amœbic, one grain of emetine-bismuth-iodide may be given daily to an adult for three days. At bed-time or after a little food is the best time for giving this drug. Or emetine periodide, two grains thrice daily after food, may be given to an adult for five days. Emetine should not be given without medical advice as a rule; but if that advice is unobtainable, it is right to give the emetine without skilled aid and to show the patient to a doctor at the first opportunity. If the patient seems better after this short course of emetine and still no doctor is at hand, he may be given 15 grains of Yatren three times a day for five days.

If the dysentery is not very considerably better after three days of emetine, the disease is probably not of the amœbic, but of the bacillary variety. No harm, however, will have been done by the administration of emetine. In such case the treatment appropriate for bacillary dysentery should be adopted. One drachm of the strong magnesium sulphate solution, Prescription No. 54, should be taken every hour until all blood has ceased, after that every three or four hours, till mucus has ceased also. Should there be much griping, 2 minims of chlorodyne or 2 minims of tincture of opium may be put into each dose of the magnesium sulphate solution.

If there is much straining with the passage of motions, and the patient remains on the pan passing nothing but a little mucus and blood, it indicates that the rectum is the part of the bowel chiefly affected, and in these cases one-pint injections of calcium or potassium permanganate solution, 6 grains to the ounce, will be of benefit: they should be employed three or four times a day.

As the patient gets better and begins to feel hungry, the Indian medicine isapghul, given as described in Chapter XXIII p. 616, is useful.

The sufferer from dysentery should be put on a purely milk diet: if he be found to pass curds, then he should be given whey or equal parts of whey and milk; while albumen water may be used in very bad cases where milk seems to irritate. As the mucus disappears from the stools, the patient can be advanced on to sago, arrowroot, rice and milk, broths, and so on to eggs and solid food. After all mucus has entirely disappeared from the motions, but there still remains a little looseness, the bismuth mixture, Prescription No. 42, may be given: but care must be taken that the patient does not become too constipated, or the site of the ulcers in the bowel will be irritated by the passage of hard motions over them.

CHRONIC DYSENTERY

If dysentery has lasted a month it may be called chronic, and will by that time present features somewhat different from the acute attack. What has already been written about acute dysentery in the preceding section should be read before this since the same distinction between the dysenteries holds good, and both amœbic and bacillary varieties may become chronic, and each has its appropriate treatment. The patient will now be thin, weak and somewhat anæmic, and one is faced with the difficulty that while he requires free nourishment to maintain his strength, yet any increase of diet may cause a relapse of the dysentery. It is important that a doctor should see the patient with a view to making sure that the disease is chronic dysentery, and also to determine whether the amœba is present in the stools. But if that is impossible, emetine should be given to the patient now, if that has not already been done. The emetine-bismuth-iodide or emetine periodide in the dosages above recommended for an adult may be given for three days and then followed by Yatren in the same dosage above recommended for five days. Should the emetine and Yatren cause no improvement, and the case be of the bacillary type, do not give salines as in the acute form of the disease; but, if possible, get some albargin with which to perform rectal injections, as described in Chapter XX.

The albargin should be dissolved in water, 1 grain to the ounce, and one pint of this slowly injected daily on three

successive days. The enema should be retained for fifteen minutes if possible. Until albargin is obtained calcium or potassium permanganate should be employed for injection as recommended in the preceding section. Should the disease still prove obstinate the vaccine treatment may be employed, for which it is necessary to consult a skilled physician.

For diet, milk should still be the staple food, and to prevent heavy curdling, 3 grains of citrate of soda should be added to each pint of milk. It is necessary also that the milk be taken in a suitable manner. Milk should be taken frequently in small quantities. If quickly swallowed in large quantities it forms a curdled mass in the stomach, difficult of digestion. By taking one and a half ounces of milk every hour during the day and night, one quart would be consumed. At first it is advisable to take one quart, or even less *per diem*, gradually increasing the quantity to two or three quarts in the twenty hours; the patient not being roused from sleep to take milk, but taking some in the night if awake. But even the small quantity first mentioned should not be swallowed at once, but should be sipped very gradually. Tepid milk usually agrees best, and it is advisable that it should be previously boiled. If milk given alone does not agree, it may be tried mixed with one-third of lime water; or it may be peptonised. To satisfy the patient a little good bread or sago may also be occasionally given, and exceptionally a little broth, or raw-meat tea. But the less of anything besides milk which is taken the more likely is the treatment to be successful. At first the patient may probably complain of not being able to take, or digest, the milk, or even of feeling weaker.

If he expresses a loathing for milky foods, or seems really unable to digest them, the advice given under Sprue with regard to this point should be borne in mind, and he may be given meat juices and meat to chew. Isapghul, a cup twice a day, may also be given as described in Chapter XXIII, p. 616.

Should the dysentery prove very intractable it is important that the patient leave the tropics. A return to English food is often beneficial; indeed, recovery seems sometimes to occur before the homeward ship has reached Aden.

HILL DIARRHOEA

It is common for visitors to Indian hill stations to be

seized with a peculiar form of diarrhoea, especially during the rains. It may begin at once on a new arrival reaching the hills, and may last for months, and may, moreover, be cured at once, if not allowed to go on too long, on the patient's return to the plains. Children are rarely attacked.

The cause of hill diarrhoea is not thoroughly established. It has not to do with the water-supply, nor is it due to the presence of mica particles in hill water, as has been thought. The fact that it usually occurs during the rains, when rapid changes of temperature are frequent, and that at this time of year a similar form of diarrhoea occurs sometimes on the plains, suggests that it is due to the depressing effect of the lowered temperature and atmosphere on the functions of the pancreas and liver, that have been accustomed for so many months to a warm and, to them, stimulating climate. The symptoms of the illness are in accordance with this. The stools are semi-liquid, light grey in colour and very frothy. The amount of wind in the bowels is evidenced also by flatulent dyspepsia, which is often present. There is no pain about the passage of the motion, but preceding it a sense of fulness and discomfort, which is relieved by the diarrhoea. The diarrhoea is only troublesome in the morning, usually from 5 A.M. onwards, and the last of the motions, of which there are usually only two or three, is passed at 11 A.M.

The general health is not much affected at first, but the danger is that the disease, if neglected, may go on to Sprue, which is a dangerous illness.

Treatment. Never neglect hill diarrhoea. On the first sign of it go on to a light, even a milk, diet, and wear warm woollen clothing, including a flannel belt which should be applied rather tightly round the abdomen.

These precautions, combined with the taking of one of the natural aperient waters first thing in the morning, will often stop the attack.

Or in place of a natural water equal quantities of sodium and magnesium sulphates sufficient to cause one free motion may be taken on waking.

Liquor hydrargyri perchloride, $\frac{1}{2}$ drachm, combined with 1 ounce doses of Prescription No. 42 three times a day will also be useful.

Should the diarrhoea not yield shortly to a strict diet, to rest in bed and to the above medicines, a lower elevation should be sought. It may be necessary to return to the plains

however hot and uncomfortable they may then be.

SPRUE

In fully developed form this disease is characterised by chronic diarrhoea, dyspeptic distention of the abdomen, soreness of the tongue and mouth and pronounced emaciation of the body. Usually the stools are large, frothy, semi-solid and pale in colour and the frequency of the stools is most marked early in the morning and forenoon. Children seem rarely to suffer.

So much ill health is taken for granted, especially in the tropics, that the early beginnings of this disease have not been carefully observed. But there is reason to believe that the symptoms described above gradually develop after a fairly prolonged period of ill health. During this period are to be noticed malaise, distaste for food, loss of appetite combined with irregularity of bowels extending over a period of months and even years. Diarrhoea at this stage is evanescent coming on for a few days and then disappearing. Now and then the diarrhoea is associated with tenderness of the tongue and the inside of the lips. Gradually the diarrhoea gets well established and 2 to 10, and even more, large, bulky, pale, fermenting stools are passed and there is progressive loss of weight. Sometimes sprue follows on full diarrhoea and sometimes on dysentery and usually begins during or soon after the rainy seasons.

The cause of the disease is still unknown, but recent work suggests that it is of the nature of a "dietetic deficiency". Dietetic deficiency does not refer to deficiency of quantity of food, but to the lack from food of certain vital principles which are essential for the well being of the body. Even if dietetic deficiency is not the sole cause of the disease and some sort of infection of the gastro-intestinal canal plays a part, it is possible that the ground is prepared by dietetic deficiency to permit an infection to take root.

Prevention. This disease is serious and often means very prolonged ill health, but luckily a great deal can be done to prevent it by paying attention to one's diet. During the last twenty years or so, scientific work has produced a great amount of positive knowledge about food. This knowledge has put the subject of nutrition beyond the stage of theory and fads and has made it possible to lay down some definite

rules for guidance in the selection of foods needed by the body for its well being. Every one should acquaint himself or herself with this knowledge and it is not difficult to do so. A large number of excellent books written in popular language are now available; we mention only two (1) Food, Nutrition and Health, by E. V. McCollum and J. E. Becker, published by the authors at Baltimore, and (2) Food, by Major-General R. McCarrison, I.M.S., published by McMillan.

Treatment. No specific medicine is known and the treatment is largely dietetic; the guiding principles being alimentary rest with gradual return to "complete diet" planned in accordance with general rules, but with a high content of proteins of animal origin and low content of fats and carbohydrates, such as rice, bread and other starches and sugars. Begin treatment with a small opening dose of suitable saline or Castor oil; and for the first 2 or 3 days take nothing but Liver Extract equal to $1\frac{1}{2}$ lbs. of fresh liver daily, divided in 3 doses and dissolved in water. In addition, a few cups of Marmite in water may be taken. Then still continuing to take Liver Extract, take increasing quantities of skimmed cows milk brought to the boil once, beginning with about 1 pint a day, divided in small 3 hourly feeds, until 3 pints a day can be easily borne. If the whole milk is allowed to stand in a tall jar for some time, the cream comes to the surface and if almost one-fourth of the top milk is removed, the major part of the cream comes away. If desired, a part of the milk may be used as butter milk or acid milk, see p. 609. Also take the juice of two ripe oranges daily.

At this stage introduce meat into the diet: this should be, to begin with, liver, cooked in any form desired and well borne by the patient, then add vegetables, especially spinach. Spinach should be lightly boiled or steamed and passed through cloth to exclude the coarse fibres of the leaves. Next, fruit, eggs, and a small amount of bread and butter may be added. As the amount of meat is increased, milk may be reduced to a quart a day and the whole milk substituted for skimmed milk and the liver extract may now be stopped.

Additions to the diet should be made until the following diet can be consumed:

(1) Milk—a quart.

(2) Fresh meat, about 8 ounces, some of this once or twice a week should be liver or kidneys.

(3) Vegetable of low starch content, 10 ounces; Spinach

and lettuce are particularly valuable; other vegetables of this class are brussels sprouts, cabbage, cauliflower, celery, vegetable marrow, water cress, turnips, tomatoes, pumpkins, onions, leeks, kale, endive, egg plant, chard.

- (4) Fruit, 8 to 16 ounces, especially oranges, peaches, strawberries and pine-apples.
- (5) Butter and cream, not more than $1\frac{1}{2}$ ounce, both for cooking and table use.
- (6) Eggs—two.
- (7) Small amounts of bread and potatoes.
- (8) Grossly sweet foods should not be taken, but sugar in moderation is permitted for sweetening tea and coffee and other foods mentioned above.

During a considerable part of this treatment, rest in bed is necessary and the rapidity with which the diets are changed is determined by the progress of the patient as indicated by the disappearance of intestinal flatulence, abdominal distention and the character of the stools. In cases that have not been allowed to go on too long untreated, a period of about 3 weeks is usually enough. This diet should be continued for several months and if there are no relapses, normal proportion of fats and starches may be introduced into the diet.

Amongst medicines, liquor hydrargyri perchloride, $\frac{1}{2}$ drachm, added to one ounce doses of the bismuth mixture, Prescription No. 42, should be taken three times a day. A powder composed of 5 grains of salol and 5 grains of compound ipecacuanha powder taken at night may also benefit.

A warm binder should be worn applied firmly round the belly, especially at night.

Should the diarrhoea prove obstinate, lasting over a month, leave to Europe should be taken, without delay preferably for at least a year. And should the same sort of diarrhoea recur shortly after return to the tropics, the question of retirement from an occupation requiring residence in a warm country must be seriously considered.

CHAPTER VI

OTHER MEDICAL DISEASES

Alcoholism, Chronic : Anæmia : Angina Pectoris : Apoplexy :
Asthma : Blood, Spitting and Vomiting of : Bowels, Inflammation
of the : Brain, Water on the : Bronchitis : Broncho-pneumonia :
Chyluria : Cold in the Head : Colic : Constipation : Convulsions :
Cough : Cramp in the Legs : Delirium : Delirium Tremens :
Diabetes : Dropsy : Dyspepsia ; Emphysema of the Lungs :
Epilepsy : Fainting : Feet, Burning of the : Fits : Flatulence :
Gall-stones : Giddiness : Goitre : Gravel : Headache : Heart,
Diseases of the : Heartburn : Heat, Effects of : Hiccough :
Hydrophobia : Hypochondriasis : Hysteria : Insomnia : Jaundice :
Kidney, Diseases of the : Leprosy : Liver, Diseases of the :
Lumbago : Meningitis : Myxœdema : Neuralgia : Neurasthenia :
Neuritis : Obesity : Palpitation : Palsy, Scrivener's : Paralysis :
Pleurisy : Pleurodynia : Rheumatism : Rheumatoid Arthritis :
Sciatica : Scurvy : Sea-sickness : Spleen, Enlargements of the :
Stomach, Disorders of the : Swelling of the Feet and Legs :
Tuberculosis : Urine, Diseased conditions of : Veins, Inflam-
mation of the : Vomiting : Worms

Alcoholism, Chronic. The treatment of acute alcoholic poisoning is given in Chapter VII. An account of delirium tremens, which is one effect of chronic alcoholism, is given on p. 155 : but delirium tremens is not, unfortunately, the only malady to which excessive drinkers are subject. Delirium tremens usually arises from a fit of drinking, or a debauch ; but persons who do not thus exceed, yet who are constantly taking fermented drinks (although not in sufficient quantities to produce delirium), are liable to fall into a condition to which the term chronic alcoholism has been applied. The signs and symptoms are : restlessness, sleeplessness, growing indecision of character, with loss of mental and moral power—the latter exhibited by a tendency to tell falsehoods about drink. The features become bloated and flabby, the eyes red and watery, and the whites of the eyes often yellowish. The nose may be red, and there are generally enlarged vessels to be seen ramifying about the nose and cheeks. There is also trembling of the hands. Spirit-drinkers generally become emaciated, but malt-liquor drinkers often grow obese. Then, the digestive

organs are always affected, as indicated by disgust for food, especially in the morning, by morning nausea or sickness (which the person probably endeavours to relieve by a secret glass of his favourite drink), by a furred tongue, foul, sour breath, and irregularity of the bowels with foetid stools. If the constant habit of drinking is not checked, the person probably becomes affected by a special form of liver disease, known as 'gin-drinker's liver,' cirrhosis (see p. 206); or by chronic inflammation of the stomach, chronic gastritis (see p. 166).

Chronic alcoholism can be cured if the person will abstain from drink; but so great is the drink-craving that the majority thus giving way are unable to avoid taking liquor, and will do so when opportunity presents, notwithstanding any promise to the contrary. The dipsomaniac who breaks out after periods of abstinence comes under the same category. Both require watching, as they will obtain alcohol by all manner of cunning devices, and will even drink eau-de-Cologne, &c. if they can get nothing else. When such patients come under medical treatment, they usually do so for the dyspeptic symptoms detailed above, and are not ready to confess to the amount of drink they consume, or to admit that their ailments arise from such a cause. The great points of treatment are to keep the patient altogether from alcohol, and to give plenty of food; but as there is a disgust for solid food, it should be given in the shape of milk, beef tea, soups, meat extracts, and puddings. The only certain cure is prolonged rest in a home for inebriates.

The patient should be advised to leave the East if possible, as the club, the heat, and frequently much leisure in the afternoon, all encourage him to indulge in excessive drinking.

Alcohol should never be taken before sundown in a hot climate and the first sign of excessive drinking is often indulgence during the earlier parts of the day.

The morning sickness may be much relieved by soda-water and milk in equal parts, and drop doses of ipecacuanha wine may be given in a little water every two hours for the same purpose. *Craving* for drink is best combated by 30-minim doses of tincture of capsicum, or of strong tincture of ginger, in 2 ounces of water, every three hours, or when craving or sinking feelings occur. Prescription No. 55, to which 15 minims of tincture of capsicum have been added, thrice daily is also a useful medicine.

Anæmia. The word 'anæmia' literally signifies lack of blood; but poorness of quality and not of quantity is usually the characteristic of this condition. Healthy blood contains a great number of red globules, which are seen under the microscope, and which give the blood its red colour. In anæmia these red globules are lessened in number, and are deficient in a constituent known as hæmoglobin, which contains iron, and which has the special power of carrying the oxygen, taken in by the lungs, to all parts of the body. There is also an excess of water in the blood, and some other of the constituents of the blood are changed in character.

The causes of anæmia are numerous, and in the majority of cases the anæmia must be considered a symptom of some other malady, for the proper elucidation of which, a physician must be consulted.

In the tropics pallor is common both in children and in people resident for long periods. This is not necessarily abnormal, and it is a matter of common observation that children lose their rosy cheeks soon after their arrival or return to India, only to recover them on leaving for home. These children however remain in an excellent state of health in spite of their pallor.

The causes of anæmia may be divided into the following categories: (a) Hygienic. Insufficient light, air and exercise, improper food, insufficient sleep and late hours, constipation. (b) Various diseases of a tropical nature, of which I would emphasise Hookworm infection, Malaria, Sprue and Chronic Bowel Diseases (*see* Index). (c) Chronic exhausting diseases of a non-tropical nature, including Pulmonary Tuberculosis, Rheumatism in childhood, kidney diseases and a host of other conditions. (d) Bleeding, due to piles or excessive menstruation. (e) In connection with pregnancy. (f) In infants and young children. This type of anæmia is frequently due to improper diet, late weaning, and especially to a lack of iron. (g) Certain severe primary anæmic states known as Pernicious Anæmia.

Symptoms. The skin becomes pale, and may in dark complexions present a sallow appearance. In the native and half-caste the skin loses its brilliancy and softness, becoming of a lighter tinge and looking more semi-transparent, while the ordinarily lighter-coloured palms of the hand become much whiter. The whites of the eyes look pearl-coloured, the eyes are encircled by a more or less dark ring, and the interior of the eyelids,

of the nose, and of the mouth, the tongue, and the lips, instead of being rosy red, are a pale pink colour or even quite white, the cheeks lose their colour. In addition to the bloodless cheeks, the face often appears bloated or puffy, although the body loses weight. The patient is habitually chilly, languid, and indisposed to exertion, and the extremities, especially the feet, are usually cold, although the palms of the hands may often burn. The system becomes so sensitive to cold, sore throats, catarrhs, bronchial affections, and diarrhœa result from slight atmospheric changes. The appetite becomes variable, and sometimes depraved. The urine is generally pale and bowels usually costive. There is also headache, mostly felt about the temples, or at the top of the head and often described as throbbing, or as if something were pressing down and out. It is generally relieved by taking food and by lying down, and aggravated by the erect posture or by exertion. Aching of the limbs, coming on suddenly and lasting a variable time, is a frequent symptom. The monthly courses of women become irregular, scanty, thin, watery, and painful; varied sometimes by a profuse flow. 'Whites' in women is an almost certain complication (see p. 446). As the malady progresses there is shortness of breath, especially on exertion, such as going uphill or upstairs; palpitation of the heart, pain in the left side, a tendency to fainting, ringing in the ears, spots or sparks before the eyes, the sleep is very heavy, and there may be bleeding from the nose. The previous languor and disinclination for exertion now give place to a feeling of thorough weariness. The appetite becomes more variable and fastidious, while digestion is more and more impaired. The brain, now being also affected by the deteriorated blood, presents various evidences of weakness. There is capriciousness and irritability of temper, impressions too feeble to be perceived by healthy persons harassing the anæmic. There is also loss of memory, and of the power of fixing the attention. When the malady has lasted some time the spleen may become enlarged, and swelling of the feet and ankles may be expected, increasing during the day and diminishing after rest in bed.

It is not to be understood that all the symptoms enumerated appear immediately, or in regular sequence, for the process of blood degeneration may be one of months or years, and one organ or the other may be first and most affected. Anæmia may be present in all degrees of severity, from slight

pallor and debility to the condition known as pernicious anæmia, when all the symptoms are aggravated, and the person dies, probably from sheer debility, resulting from the anæmic condition. A minor degree of the symptoms described is not incompatible with apparently fair health and with the pursuit of ordinary avocations. But warnings of anæmia should not be neglected, especially by the European in tropical climates, for the anæmic condition induces dyspepsia, neuralgia, chronic diarrhœa, fattydegeneration of the liver and heart.

Treatment. In the treatment of anæmia the first essential is to find the cause, especially as most anæmias are of the first types. The possible presence of the hook-worm (*see* p. 244) must not be forgotten and microscopical examination of the stools may be necessary. If no cause can be found, and in many cases even if it is found but is non-removeable, then symptomatic anæmia may be treated on the same general lines of suitable hygienic surroundings together with the administration of iron or iron and arsenic internally.

There should be moderate exercise every day and free ventilation of the living, sleeping, or working apartments. The diet should be nourishing, and moderate amount of animal food should be taken. Liver in various forms is, however, of great value in certain forms of anæmia. Recipes for the preparation of this food will be found in Chapter XXI (*see* p. 608). Certain vitamins are also of value, and yeast has been much used, marmite being an easily obtainable and convenient preparation. It can be combined with liver, as in the liver soup recommended in Chapter XXI. Anything causing indigestion should be avoided. Stimulants should be resorted to sparingly, if at all. Cold or tepid bathing is of great service, and change of air and scene is always useful. Tonic medicines, specially arsenic and iron, are of great value. The red globules of the blood, as previously explained, contain iron, and iron given as a medicine tends to increase their quantity. It must however be understood that anæmia depends as much on scanty absorption of iron into the system as on a deficiency of the supply of iron; hence, unless combined with well-regulated sanitary conditions, as mentioned above, iron will do little good. Some forms of iron are more easily absorbed than others. These matters being attended to, sulphate of iron may be used, and Prescription No. 51 may be taken thrice daily. This prescription will be found especially useful if there is a tendency to constipation,

or disorder of the monthly flow as well. A pill containing aloes and iron is also useful in such cases. In others the well-known Bland's pill is of great benefit and is easily taken. Iron and Ammonium Citrate in doses of 15 to 30 grains in water twice a day after meals, it is also very valuable especially in children. For anæmia following malaria arsenic may be combined with iron; three to five minims of liquor arsenicalis in water may be combined with the Iron and Ammonium Citrate thrice daily after meals. Tablets of iron and arsenic are also useful; but it is inadvisable to take any arsenical preparations, except for a few days, without medical supervision. For the anæmia of children, Iron and Ammonium Citrate, Parish's Chemical Food, the compound syrup of hypophosphites, malt extract with hæmoglobin and Iron Jelloids are all both beneficial and pleasant to take. They may also be used for adults.

Angina Pectoris. Angina pectoris or breast-pang is a symptom of disease of the heart or large arteries. An attack is characterised by a paroxysm of severe pain under the breast bone, the pain often shoots down the left arm and may leave that part tender in between attacks. There is also faintness, difficulty of breathing, and anxiety amounting to terror at times. Angina is commoner among men, usually in those past middle life. The first paroxysm may occur after some exertion, or when the patient is walking uphill, or after a heavy meal. The attack is very likely to recur, but at no fixed interval, months or years sometimes clapsing. It is rarely that the earlier attacks of breast-pang terminate fatally; but as the spasms depend on organic change in the heart or its arteries, Angina pectoris is a serious malady.

This affection is sometimes called 'true angina' to distinguish it from a less serious condition which resembles it in appearance called 'false angina'. False angina is a neurotic condition and is not dangerous: unlike true angina it is more common in women and may occur at any age, and the pain lasts an hour or so, which is longer than that of true angina.

It requires skilled medical aid to distinguish between the two.

There is another form of severe heart affection arising in the middle aged or elderly, which is associated with severe pain over the heart, but it differs from Angina, in that it often comes on at night, waking the patient out of sleep.

It is continuous pain associated with great shortness of breath and is due to the blocking of one of the small arteries supplying the heart. In this type of condition Amyl Nitrite should not be given, and the first aid treatment consists of keeping the patient as quiet as possible pending the doctor's arrival. If a doctor cannot be obtained 15 drops of Laudanum in a little water may be administered or a dose of Mixture No. 29.

The *treatment* of angina pectoris consists of two parts, one for the immediate attack, the other to ward off future attacks. For the latter the sufferer must consult a medical man as soon as possible. Meanwhile, for the actual attack and until a doctor comes he should inhale amyl nitrite from a small capsule. Amyl nitrite is put up for the purpose in small capsules to be broken between the thumb and finger, and the sufferer should always carry a little box of these in his waistcoat pocket. A teaspoonful of sal volatile in water, or 1 ounce of brandy in water may also be taken with benefit during an attack.

Apoplexy. The term apoplexy is used to signify an attack, usually sudden, attended with more or less twitching or convulsion and usually with unconsciousness, and followed by paralysis usually of one-half of the body. Such paralysis is called hemiplegia (*see* p. 215). An attack of this nature is caused as a rule either by the bursting of a blood-vessel in the brain substance, called cerebral hæmorrhage; or by the clotting of the blood in one of the brain blood-vessels (cerebral thrombosis); or by blocking of one of these vessels with some other matter (cerebral embolism). Strictly speaking, the term 'apoplexy' should be reserved for cases of cerebral hæmorrhage alone, the cases of cerebral thrombosis and embolism being called 'softening of the brain' from the nature of the effects they produce there. But as the attacks due to the various causes resemble one another, it will be well to describe them together under the popular term 'apoplexy'.

The causes of cerebral hæmorrhage are diseases of the arteries tending to make them brittle, accompanied by chronic Bright's disease (*see* p. 200) and enlarged heart. Such conditions are usually found in those getting past middle life, especially amongst those who have been free livers or strenuous workers; an hereditary tendency is also a factor.

Cerebral embolism usually accompanies heart disease and is seen in the comparatively young. It is not so common a cause as the other two conditions.

Cerebral thrombosis or clotting of blood is seen most commonly in the aged, in those with diseased blood-vessels, and in the anæmic. When met with in a young and apparently vigorous man the common cause is syphilitic disease of the blood-vessels of the brain.

The *immediate* causes of apoplexy are whatever unduly impedes or accelerates the circulation of the blood within the brain, or raises the blood pressure suddenly—such as violent exercise in those not accustomed to it; straining, as in lifting heavy weights, or as at stool; sudden mental emotions, and violent passions; intense heat; overloading the stomach.

Men are more liable to apoplexy than women. Before the attack comes on there may or may not have been warnings, such as giddiness, nausea, headache, numbness of the extremities or even a temporary paralysis. The actual attack is usually sudden, the patient falls to the ground, deprived of sense and motion, and lies like a person in a deep sleep; the face flushed, the breathing laboured, and the pulse full and slow. The pupils may be dilated, or one may be dilated and the other normal. The mouth may be drawn to one side and there may be convulsions, generally confined to one side of the body. Sometimes there is no apparent unconsciousness, the patient may go to sleep well and on waking in the morning find that he cannot move one side of his body. But as a rule in whatever way it may commence, the fit is usually ultimately characterised by insensibility, accompanied by slow, noisy, puffing breathing, and frothy saliva about the mouth. The teeth are clenched, and the person is unable to swallow; often fluids put into the mouth run out at the corners; or swallowing is performed with difficulty; the countenance becomes flushed or livid; the eyes are dull and glassy, and the pupils are contracted, or one remains dilated and the other contracted; the mouth is drawn to one side; the limbs are motionless and rigid, but sometimes convulsed, or the latter conditions present only on one side of the body. The extremities are cold, and the body is bathed in cold sweat; the bowels are either obstinately confined, or motions may be passed involuntarily. The urine may also be passed involuntarily, or retained till the bladder is full, when it dribbles away. The pulse, at first slow, becomes quicker, fuller, and stronger as the system recovers from the first shock, although it often remains less frequent than natural, and may be

irregular; falling to 60 beats per minute, and rising to 110 are both unfavourable signs.

The duration of an apoplectic fit varies from two to three hours to as many days. The longer the apoplectic condition continues without improvement, the less is the prospect of recovery. It may terminate by gradually passing off, leaving the person *apparently* little the worse, or it may terminate in incomplete recovery, the mind remaining impaired, or some part of the body being paralysed; or, the person not regaining sensibility, the increasing stupor may end in death.

Often with paralysis of the right side the patient is unable either to speak at all or to express himself clearly. This is called 'aphasia,' and is usually recovered from to a large extent.

The deep unconsciousness, or coma, that often accompanies apoplexy is to be distinguished from the insensibility of (a) fainting or syncope, (b) from the effects of alcohol, (c) from the results of narcotic poisons as opium, (d) from epilepsy, and (e) from the insensibility following injury causing compression or concussion of the brain.

(a) As a rule persons fainting recover in a few minutes, the pulse becoming more distinct, and intelligence being gradually restored. The apoplectic attack continues as described on the preceding page.

(b) Apoplexy is to be distinguished from the effects of alcohol: first, by the history of the case; secondly, by the smell of liquor in the person's breath, although it must be recollected that that is not a certain sign that the patient has been drinking, for some one may, in mistaken kindness, have given the person struck by apoplexy some kind of spirit; thirdly, in the 'drunken fit' the pupils are equal, while in apoplexy one is often contracted and the other dilated; fourthly, the person 'dead drunk,' as it is termed, may generally be roused, when he babbles incoherently—from apoplexy the person cannot be roused; fifthly, if the patient be carefully watched, any movements which occur will be usually found to be restricted to one side of the body in apoplexy, while movements occur on both sides in drunkenness.

(c) Apoplexy is to be distinguished from poisoning by opium: first, by the history of the case; as apoplexy may have been preceded by premonitory symptoms, and opium-poisoning is not so preceded. Apoplexy may come on during

or immediately after a meal ; while if opium is given during a meal symptoms do not occur for from ten to thirty minutes ; secondly, by the absence or presence of the smell of opium in the breath or vomit ; thirdly, by the equal contraction of both pupils caused by opium ; fourthly, apoplexy usually occurs suddenly ; the symptoms of opium poisoning come on gradually ; fifthly, even while the patient is unconscious it may be evident that one side of the body is flaccid and paralysed, which is characteristic of apoplexy.

(d) Apoplexy is known from epilepsy by the presence of puffing breathing, which is absent in the latter malady. In epilepsy also there is convulsive movements of the limbs ; the eyes are turned up under the lids, so that the whites only are visible ; and the person generally falls down with a loud cry, none of which are symptoms of apoplexy. In epilepsy the patient is as a rule young, and there will be a history of previous fits.

(e) Apoplexy usually occurs in elderly people, and no signs of injury are necessarily present, thus contrasting with compression and concussion.

Treatment. The first thing in all cases is to loosen the patient's shirt collar, to raise his head slightly, and give free access of air. The forehead should be bathed with cold water, or, if available, a bladder of pounded ice should be applied. The head and shoulders should be propped to one side to prevent the tongue falling back and obstructing breathing. Unless the patient's temperature is abnormally high, apply hot-water bottles to the abdomen and lower limbs, taking care not to burn him. Further immediate treatment differs according to whether the cause of the fit is cerebral hæmorrhage or thrombosis, and it takes a doctor to decide that. Do not give stimulants. In all cases an enema (see p. 588) should be given as soon as possible. If the person lies insensible more than six or seven hours, without making water, the catheter should be used (see p. 585). If the urine is retained till the bladder is full, and then dribbles away, it is a sign that the urine should have been drawn off before. In the subsequent treatment of the patient special care must be taken to avoid bed sores and to keep the bowels open. The resulting paralysis, hemiplegia, will tend to get better of itself, and improvement may be hoped for up to a year from its onset. Treatment will have no great effect on the course of the paralysis, though electricity and massage should be persisted in. Most

people who recover from the initial attack of apoplectic paralysis show considerable improvement.

Asthma. Asthma is a disease characterised by attacks of difficulty of breathing occurring in paroxysms: it is due in some cases to spasm of the muscles of the bronchial tubes, in others to sudden swelling of the mucous membrane lining these tubes, while in some cases both these factors operate. Asthma is very common in some parts of India. There is a considerable neurotic element about the disease. It may begin early in life or at middle age, and is frequently seen beginning about the age of fourteen. It is commoner amongst males. Asthma is related to hay asthma or hay fever (*see p. 428*) and, like that disease, may sometimes be cured by treatment of the nose. A large number of the invalids commonly called asthmatic are not suffering from asthma at all, but from chronic bronchitis and emphysema (*see p. 145*). It is true that asthma after it has been established some time produces emphysema, and that in its turn encourages chronic bronchitis, so that the ultimate state of the patient finds him with signs of all three diseases. In such a case he is usually constantly ill with remissions according to the climate and the time of year. In true asthma in its earlier stages the patient is subject to fits of the spasmodic attacks at more or less frequent intervals. Attacks of asthma are largely dependent upon the state of the digestion; so that dyspepsia must be treated where existent and the diet attended to. A fit of asthma is a typical and distressing sight. It may occur at any time, often in the night. The seizure is sometimes preceded by languor, flatulence, headache, heaviness over the eyes, sickness, pale urine, disturbed rest, and a sense of oppression about the heart. Yet it often comes on suddenly, without such warnings, the patient waking from his first and deepest sleep labouring for breath. When the fit is at its worst there is intense difficulty of respiration, the patient sitting up in bed, or standing holding on to a table or chair, breathing hard with a wheezing noise. The face becomes livid or bluish, the eyes look prominent, the body is covered with cold perspiration, suffocation appears impending the sufferer often struggles to the window, which he desires may be open, and there may be cramp in the legs. A paroxysm may last minutes or hours, and when subsiding there is often expectoration of little pellets of thick phlegm or mucous, and perhaps a copious discharge of pale urine. The

length of time between successive fits of asthma varies much, during which the person, if he takes care, usually enjoys fairly good health, unless the condition known as emphysema also exists. Too often, however, the patient becomes emphysematous and suffers from chronic bronchitis as well. He is then always wheezing, as described on p. 168, and has periods when his asthmatic spasms make him worse than others.

Treatment. The treatment of asthma may be divided into that during a fit, and that in between the attacks. During a paroxysm the patient will prefer to sit up or even to stand up catching hold of a support, as by this means he can employ his muscles of forced respiration better. If the attack has followed an injudicious meal, as a late supper or dinner, a mustard emetic (see Chapter VII) should be administered.

Five minims of Adrenalin Hydrochloride injected under the skin has frequently given immediate relief in the acute asthmatic paroxysms. If there is no means available of giving this drug, Ephedrine Hydrochloride, which can be easily purchased in tablets of $\frac{1}{2}$ gr. may be given in the dose of one tablet, repeated after two hours if no effect is apparent.

Smoking *datura stramonium* leaves sometimes relieves asthma, especially if the smoking is commenced *before* the fit is fully formed. From 10 to 30 grains of the dried leaves may be smoked in a common pipe, which will often, if taken in time, prevent an expected paroxysm. Another way to use stramonium is in the form of cigarettes. But the most convenient form is that of Prescription No. 69, the compound stramonium powder, which may be ignited with a little charcoal on a plate, and the fumes inhaled.

Stramonium inhalations are not advisable, if the patient suffers from much bronchitis and cough in between the attacks.

In between the asthmatic attacks much may be done for the patient; treatment now will lie upon three different lines, climate, diet, and drugs, and in many cases a good ear, nose and throat surgeon should be consulted.

Asthma is oftener relieved by change of climate than by medical treatment, although it cannot be said with certainty what climate will suit each individual case. Sometimes a dry, at others a moist climate affords most relief; sometimes town, sometimes country. A very slight change, as from one street to another, or from one house to another, has been

known to check the attacks. As a rule, elevated regions, as hill stations, do not suit asthmatics, on account of the greater rarefaction of the air.

On the other hand a high climate, with absolutely pure dust free air may give complete relief.

Only practical experiments on the patient's part can determine what climate will suit him. The senior author has heard of one patient who gets an attack as soon as he comes near the effluvium from a horse, and of another who is never well unless he lives over a stable. Recently he has met another patient who is free from asthma everywhere except in Cawnpore: one mile away from Cawnpore he is safe; but on entering that city he is affected within an hour.

Much may be done by avoiding dyspepsia and regulating the diet, and here again personal idiosyncrasy comes into play. However well the person may feel during the intervals between the fits, he should never exceed in diet. Breakfast, which should be the chief meal, should consist of an egg, or chop, or cold chicken; tea is better than coffee, and milk and water better than either. Mutton ought to be the staple dinner diet, with green vegetables and potatoes in moderation, provided they do not cause flatulence. No pastry should be used, and there should be no dessert, but stewed fruits or light pudding may generally be taken with impunity. Sausages, kidneys, salt boiled beef, pickles, or toasted cheese should never be eaten. Water is the best drink. Late dinners are to be avoided, and the asthmatic should never eat as much as he can. It is only by the exercise of self-denial in diet that the sufferer from asthma can live in comparative ease and comfort. Similarly, he should avoid excitement, fits often arising from emotions.

Should flatulence and dyspepsia be in evidence, the section on Dyspepsia should be read and the particular variety treated. Relief will perhaps be obtained by Prescription No. 57 thrice daily, either shortly before or half an hour after meals.

Regarding other drug treatment, more benefit will probably be obtained by a course of potassium iodide and arsenic in between the attacks than by anything else. Prescription No. 56, 1 ounce thrice daily to which 3 minims of liquor arsenicalis has been added, may be taken after food.

Blood, Spitting and Vomiting of. Blood proceeding from the mouth may come from different sources. It may be from the throat or tonsils, in which case the quantity brought

up is small, and the bleeding part, probably an ulcer of the tonsils, may be easily seen. This bleeding is of little consequence, and requires no particular treatment. Or blood may come from the gums, as in scurvy, or pyorrhœa, when it should be treated by the remedies proper to those diseases. Or blood may proceed from the socket of a tooth which has been extracted, or it may come from the back part of the nose.

Spitting of blood from the lungs, or hæmoptysis, is serious and is often a symptom of consumption. In young and adult men the spitting of blood is most probably due to tuberculosis of the lungs (consumption) in the absence of other evident causes. It is not such an evident symptom amongst women or children, who are more prone to bleed from other causes as well as from phthisis. The blood coughed up may be slight, just streaking the sputum, or it may be in larger amount (perhaps half a cupful with clots), or there may be a large and sudden gush of blood. The blood is usually bright red and frothy. In any case the patient must consult a doctor at once, and in the two latter events, where the blood is more than slight, he must be in bed at absolute rest and perfectly silent. He should in the severer cases be given nothing to eat nor to drink, except teaspoons of water, iced if preferred until the doctor's arrival. If there is pain in any one part of the chest indicating the source of the bleeding, a bag of crushed ice may with advantage be put over the spot. Read the article on Tuberculosis of the Lungs on p. 225.

Vomiting of blood or hæmatemesis must be distinguished from hæmoptysis, the spitting or coughing of blood. Blood from the stomach is usually dark in colour: from the lungs bright red and often frothy. Hæmatemesis is in some cases dependent on disease of the liver or spleen. But in the majority of instances it occurs in consequence of an ulcer in the stomach eating into a blood-vessel. In all such cases the blood is vomited, not coughed up, and its colour is almost black, like coffee-grounds—not red; and some blood is often passed by the bowels. It is generally preceded or accompanied by burning pain in the stomach, and if the ulcer is large the loss of blood is sufficient to cause alarming faintness, which may be felt before any blood is vomited, and for which stimulants must not be given. The great point is to keep the stomach at rest, so as to allow the ulcer to heal, or, at least, the ruptured vessel to become plugged up. This

will not take place if the stomach is excited to action by food or if the circulation is excited by stimulants. Nothing must be given until the doctor has seen the patient. The rest not only of the stomach but of the whole body must be absolute; if much blood has been lost and the patient is faint he should be allowed to lie on the floor where he may have fallen and made comfortable there with cushions. Disturb him as little as possible. The doctor on arrival may consider the patient able to take small quantities of milk by the mouth, or he may order nutrient enemata (see Chapter XX). In all cases both of hæmoptysis and hæmatemesis medical advice must be sought immediately.

The chief distinctions between the signs of hæmoptysis and hæmatemesis are given here; but not all these distinctions may be present in any given case:

HÆMOPTYSIS, OR SPITTING OF BLOOD	HÆMATEMESIS, OR VOMITING OF BLOOD
Usually difficulty of breathing, pain in chest.	Nausea, pain, and tenderness at the pit of the stomach.
Blood coughed up in mouthfuls.	Blood vomited profusely.
Blood frothy.	Blood not frothy.
Blood of a florid red colour.	Blood generally dark-coloured.
Blood mixed with saliva.	Blood mixed with food.
No blood passed by 'stool' as a rule.	Blood sometimes passed by 'stool.'
Cough and bronchial symptoms.	Symptoms of dyspepsia.

Bowels, Inflammation of the. Under this term are included the different distinctions, as *peritonitis* and *enteritis* drawn by physicians. For *peritonitis* see Index. For *enteritis*, Chapter V on diarrhœa should be read, and for the disease in children read the article on diarrhœa in Chapter XVII.

Brain, Water on the. This is a chronic malady coming on slowly and insidiously, so that its origin can scarcely be dated from any particular time. Children are sometimes born with the disease, which slowly develops after birth. But sometimes water on the brain is a result of meningitis. The head often becomes of an immense size (known as the hydrocephalic head), but the child may survive as an idiot for months or even for years. Such cases are always accompanied by wasting, languor, drowsiness, irritability, frequent attacks of diarrhœa alternating with constipation, and often a tendency to convulsions. Such cases rarely terminate favourably, and medicines are useless.

Parents often express anxiety about the large size of their children's heads, and fear the enlargement, real or supposed, may be due to water on the brain. It is therefore mentioned that the disease is not nearly so common as is popularly supposed, and that the large size of any child's head is not to be attributed to water therein, unless accompanied by other decided symptoms of the disease.

Breath, Bad. A bad smell in the breath may be due to a variety of causes. The commonest is an unclean condition of the mouth. The trouble then may lie in carious teeth, or in suppurating gums (*see* p. 337), or in some other local inflammation, such as tonsillitis. Diseases of the nose may also give rise to a foul odour in the breath. Diseases of the stomach are another common cause of this condition, especially chronic gastritis (p. 166). When the cause of the gastritis is alcohol, a vinous odour may be noticed in the breath.

It is uncommon for lung diseases to affect the breath badly at any rate in their early stages.

Peculiar odours in the breath also occur in certain general diseases, such as diabetes and some kinds of kidney disease.

When the breath is persistently bad, a doctor should be consulted, or a dentist, if the trouble is known to lie in the mouth.

Bronchitis. This is the term applied to inflammation of the lining membrane of the air-passages, or tubes leading to the lungs. Bronchitis is generally caused by chill, and commences with symptoms of a common 'cold'. There is first, running at the nose, and a feeling of chilliness and aching pains in the limbs; slight rise of temperature; the patient is thirsty and feverish; and there is languor, headache, furred tongue, loss of appetite, and restlessness. There is also a feeling of soreness behind the breast-bone, and of constriction or tightness of the chest. At first there is a dry, hacking cough, the breathing is oppressed and difficult, and very little phlegm is brought up. The fever of *en* becomes considerable, and the pulse may rise to 120 or higher, the respiration rate is not usually over 35. *cf.* pneumonia. In favourable cases, in three or four days the cough becomes loose, and the expectoration more abundant. The expectoration during the earlier period of the malady is frothy when first coughed up, but becomes glairy, like unboiled white of egg, when allowed to remain in the receptacle. After some days the expectoration becomes thicker, and of a greenish-yellow colour, and the feeling of

soreness and constriction of the chest then passes away. Throughout the attack, wheezing sounds may be heard with the breathing, and a thrill may be felt when the hand is placed on the chest or back. These signs will partly disappear after phlegm has been coughed up, but occur again with reaccumulation of mucous in the air-passages. The sounds and thrill are due to the air passing through the viscid mucous which more or less fills the bronchial tubes. Exertion or exposure to cold air increases both the cough and difficulty of breathing. In favourable cases the disease abates about the eighth day, the difficulty of breathing subsides, the expectoration is expelled with less difficulty, and the fever declines.

Bronchitis often attacks Indians who are suffering from fever during the cold season, especially in the northern districts of India, and on the sea-coasts, which are exposed to great variations of temperature, consequent on the land and sea breezes, and the lulls between. This complication frequently renders the fevers of natives very dangerous. But European adults are less liable to bronchitis in India.

Treatment. Mild cases of bronchitis are benefited by warm bath, 8 or 10 grains of Dover's powder taken at night with $\frac{1}{2}$ -drachm doses of sweet spirits of nitrous ether, in 2 ounces of water, every three hours, and the encouragement of free perspiration in bed. A little prepared barley, boiled in half a pint of milk, to which is added half a wineglassful of brandy or whisky, with nutmeg, lemon-juice, and sugar according to taste, will be found a very useful and agreeable potion, as it both allays thirst and induces perspiration. The patient should be kept in bed, and be carefully guarded against cold, the temperature of the apartment being maintained day and night as equable as possible. A certain amount of moisture in the air is also advisable, and to effect this the steam from a bronchitis kettle (see p. 584.) should be allowed to escape near the patient. In the early and dry stages of bronchitis, benefit may be obtained from giving four-hourly 1 ounce of Prescription No. 41. When the secretion becomes free and expectoration is established, give Prescription No. 40, 1 ounce thrice daily. The diet should be light and on the lines laid down for fevers in Chapter IV. Alcoholic stimulant is often necessary in the severer attacks of the disease.

Chronic Bronchitis is a form of bronchitis that lasts

long and is usually without fever : it tends to recur frequently, especially in cold weather and in the aged. When it has a seasonal recurrence it is known as 'winter cough.' This disease tends to produce the condition of emphysema (*see* p. 168).

For chronic bronchitis give Prescription No. 40 ; if the cough is tight on the chest and the sputum comes up with difficulty, add 2 grains of potassium iodide to each ounce of the mixture. If the cough is dry and irritable, and there does not seem to be much to spit up, relief may be obtained by Prescription No. 39, 1 ounce thrice daily.

Broncho-pneumonia. When the catarrh of the bronchial tubes that exists in bronchitis extends further down the tubes until it reaches their smallest branches, and after that the lung cells themselves, the condition is called broncho-pneumonia. Broncho-pneumonia is common in children, especially after measles and whooping-cough, and a fuller account of the disease in children is given in Chapter XVII. But broncho-pneumonia also occurs in adults, especially in the aged. It has many differences from true pneumonia ; it does not begin nor end so abruptly as pneumonia, where the lung is primarily affected ; and the fever usually lasts longer.

Treatment should be as given above for the severer forms of acute bronchitis, including the use of a bronchitis kettle.

Chyluria. This term is applied to a milky condition of the urine. Sometimes a milky discharge takes place from the lymph vessels of the armpit, groin, or scrotum. It may be the accompaniment of elephantiasis, and be due, like that disease, to blocking of lymph-channels by living or dead adult filaria worms. If so, the embryo worms may be found in the blood. The treatment is very difficult and often unsatisfactory : a doctor should always be consulted.

Cold in the Head. A cold in the head, or coryza, is a catarrh of the nasal mucous membrane. Often the membranes of the throat are also involved, and the catarrh may extend downwards to the bronchial tubes, giving rise to bronchitis.

The symptoms of a cold are too well known to need description. It should be noted that there are three stages in its course. First the feeling of being unwell, accompanied, perhaps, by a slight rise of temperature, headache, and feeling of chilliness. It is important to recognise this stage, as by active treatment then a cold may often be aborted. In a very short time it goes on to the 'stuffy stage' when, the

mucous membranes being swollen, the nasal passage is blocked, and frontal headache is worse. After a day or so of this the stage of free running from the nose is reached, and this may last several days.

The catarrh is due to infection of the mucous membrane by some micro-organism, and if this organism can be eradicated at the very beginning a cure will be effected. It is not always the same kind of organism that causes a cold, but, whichever the causative microbe may be, the infection may arise in one of two ways. Either the infection comes from another person—in popular parlance the cold is 'caught'—or the organism was previously present in the individual, and some depressing factor such as a chill or wet feet was sufficient to lower his resisting powers temporarily to such an extent that the organism, which had hitherto been unable to make its presence felt, is now able to flourish and cause its characteristic symptoms.

It follows from this that besides avoiding proximity to those who already have colds, we must also avoid overcrowded rooms, sudden changes of temperature, cold winds and other depressant conditions that may allow the organisms already present in the nasal cavity to infect us and extend their growth.

Treatment. In the first stage, that is to say immediately the onset of a cold is suspected, the nasal cavities should be washed out either by means of a nasal douche or, better still, by means of some form of atomiser or nebuliser (Fig. 55). The proprietary medicine glycothymoline may suitably be used for this purpose as recommended in Chapter XX, employing the dilution given on the bottle. An efficient substitute for glycothymoline consists in a solution of 2 grains each of sodium bicarbonate, sodium baborate and sodium chloride, together with 1/24 grain of menthol in 1 ounce of water. The use of such a douche five or six times a day should be combined with frequent doses of quinine; Prescription No. 36, ½ ounce every hour till 15 grains of quinine sulphate have been taken. If the onset of the cold is towards evening, after the nasal douche, 10 grains of Dover's powder should be taken, followed by some hot milk, and the patient go to bed at once. In any case early taking to bed is likely to lessen the severity of the attack. If such vigorous measures be taken in the earliest stages, a cold may often be cut short. Should, however, it go on to the next or 'stuffy' stage, then

the cold is bound to run its course, though that course may still be modified by active treatment. The diaphoretic mixture, Prescription No. 41, should be given, 1 ounce every four hours, provided the patient remains in a warm room, preferably in bed.

When the cold begins to run, if the mucus is thick and purulent, the nasal douche should still be employed. If the discharge is only thin and watery and is excessive, relief may be obtained by the use of Ferrier's snuff, which consists of morphine hydrochloride 1 grain, powdered acacia 1 drachm, bismuth subnitrate 3 drachms. As this contains morphia, the bottle should be kept carefully as a poison bottle. Should the cold go down into the chest, as it is called, then bronchitis is produced, and expectorant mixtures will be required.

The patient should take every care to avoid conveying his infection to others; close proximity to his fellows should be avoided.

Colic. The term 'colic' is used to express different forms of severe griping pain. Thus renal colic refers to the griping accompanying passage of a stone from the kidney; biliary colic accompanies the passage of a gall-stone from the gall-bladder. These colics will be found described on p. 175. Used alone the word 'colic' refers to griping of the bowels, that is to say pain due to violent contraction of the bowel muscle or to distention of the bowel with wind. Colic is sometimes referred to as the 'gripes', 'cramps', 'spasms', or as 'stomach-ache.'

Colic is a symptom of intestinal indigestion, and is due usually to the presence of indigestible or irritant food in the intestine. It will be seen that this cause is the same as that of the irritant diarrhoea described on p. 109. In fact, colic and diarrhoea go hand in hand, the colic being the pain due to the presence of the irritant material and the bowel's efforts to expel it, and the diarrhoea being the result of that effort.

Colic usually comes on suddenly, often in the night, with spasmodic griping and twisting pain in the bowels, often faintness and nausea, and perhaps vomiting. There is also spasmodic retraction of the muscles about the navel, which part appears drawn inwards. The bowels may be constipated at first, and distended with wind. At a later period there is usually strong desire to go to stool: the passage of a motion is attended with escape of gas, and great relief.

Colic is relieved by pressure on the bowels, the patient frequently rolling about, or lying on the belly. Often, if the patient is in bed, or lying on the back the legs are so bent that the thighs press on the bowels, the legs being retained in such position by the hands grasping the shins. The object of this attitude is relaxation of the abdominal muscles. This distinguishes the malady from appendicitis or peritonitis, in which state pressure is very painful, and the patient lies on the back and remains still, with his legs drawn up. There is ordinarily no feverishness with colic, while appendicitis is usually attended with fever.

Colic should be also distinguished from renal colic, from biliary colic, from the beginning of dysentery, from cholera cramps, and from appendicitis.

In renal colic (p. 175) the testicle is often retracted and there is pain shooting down the inside of the thigh; there is also pain in the loins and frequent desire to pass water. The pain in gall-stone colic is felt just to the right of the pit of the stomach, shooting through to the back and right shoulder.

The griping pains felt at the beginning of dysentery are not so violent as those of colic, are less twisting or wringing in their character, and are attended with diarrhoea instead of constipation. In cholera, there is usually, preceding diarrhoea, vomiting, then purging of white fluid, and stoppage of urine. The symptoms of appendicitis may resemble colic; but with the former there is usually fever and much tenderness of the abdomen, and the pain in the course of hours is likely to become localised in one spot.

Treatment. It is inadvisable to give any purgatives without an expert medical opinion. The diagnosis of acute abdominal pain is difficult even for trained medical men and many tragedies have occurred from the administration of castor oil in cases of acute appendicitis and intestinal obstructions. The best measure to adopt is to give the patient a hot water bag to apply to the abdomen, and a teaspoonful of Salvolatile in a wine-glassful of water pending the arrival of the doctor.

Lead poisoning may also give rise to intestinal colic.

Constipation. A tendency to confined bowels is natural to many persons, especially to women.

Ordinarily the bowels should be moved once daily, but to some this does not naturally occur, and the condition is unattended by unpleasant symptoms. For constipation of this

description, medicines, as a rule, are unnecessary, exercise, more fluid and fruit diet will remove the evil.

Constipation may be a symptom of certain acute diseases, such as enteric fever, or of chronic diseases such as affections of the liver or stomach, or of anæmia. Or it may be due to mechanical obstruction of some part of the bowel. With such symptomatic constipation we shall not deal here, but rather with the constipation that exists without obvious cause. Such constipation is usually due to an accumulation of fecal matter in the rectum which becomes insensitive to the stimulus of distension, and is not due to delay in the emptying of the colon. Large doses of aperients in this type of constipation increase the toxic absorption from the bowel by keeping its contents liquid and hurrying the food into its lower reaches where it ferments.

Constipation is less commonly due to actual delay in the passage of the fecal matter along the bowel. This type of constipation may give rise to certain symptoms, such as lassitude, mental depression, lack of appetite, and a furred tongue. Headache is also a frequent symptom, especially either in the forehead or right at the back of the head. In some cases the symptoms may be still more marked, and a sallow complexion with loss of flesh and the symptoms of neurasthenia may be due to retention of feces in the large intestine.

Certain general rules should be observed in the treatment of constipation, and the first rule is to try and correct the condition without the use of purgatives. These drugs are many of them irritant to the bowel, cause the contents to become fluid and so increase the toxic absorption and lessen the response of the bowel to natural stimuli, thus rendering the condition worse.

The second rule is not to allow the affairs of the bowels to become an obsession. Many persons are miserable if they pass a single day without bowel action and complain of all manner of symptoms. This anxiety tends to upset the nervous mechanism of bowel evacuation and to encourage the use of purgatives to the detriment of the bowels.

The third rule is regularity. A special time should be allotted for bowel action, preferably after a meal such as breakfast, and the habit should on no account be broken. Even if there is no desire to defæcate an attempt should be made at the proper time.

The fourth rule is dietetic. Plenty of fluid is essential and the diet should be adequate, containing fruit and vegetables; these substances supply the bulk which is necessary to stimulate the bowel to pass its contents along. A glass of water on rising in the morning is a good rule, and in hot weather four or five pints of fluid should be taken during the day.

We now come to the question of other measures including the use of drugs. Firstly, massage may assist defæcation; this may be carried out with a bag of shot weighing 4 to 6 pounds which may be rolled over the belly every morning for five or ten minutes, passing up from the right lower corner, across the top of the abdomen and down the left side to the left lower corner.

Drugs. For an occasional Purgative prescription No. 27 first thing in the morning or one or two of the pills of Prescription No. 62 at night will be found useful.

In habitual constipation two drachms of Sodium Sulphate (Glauber Salts) in the morning in a large draught of water or a dessertspoonful of Enos Fruit Salts may be tried if the above measures fail. Better than these are Paraffin or one of its preparations, taken at night, or thrice daily in doses that vary from two teaspoonsful to one tablespoonful, according to the needs of the patient. Petrolagar, "blue label", or Agarol, are well known preparations, which will be found useful. Another good drug is Cascara Sagrada which may be taken in doses up to one drachm of the Liquid Extract, or as Cascara Evacuant* up to half a drachm at night or more often if necessary.

If all these measures fail, a small enema or a glycerine suppository may be found effective, especially in the type of constipation in which there is rectal accumulation and insensitiveness. These should be taken as far as possible at the time the bowels are required to open, *i.e.*, after breakfast, thus helping to re-establish the habit.

The bowels are creatures of habit, and if the habit is disturbed troublesome constipation may ensue; if however the habit is encouraged, all will be smooth and easy.

In the tropics constipation may be found alternating with attacks of diarrhoea; in these cases a physician should be consulted as it is often a sequel to an attack of dysentery and expert advice will be required to correct the disorder in such a case.

*A preparation of Parke Davis & Co.

Convulsions. *Vide* FITS, EPILEPSY, HYSTERIA, TETANUS, HYDROPHOBIA, in all of which diseases convulsions are prominent symptoms. For the convulsions of children see Chapter XVII.

Cough. Cough is usually a symptom of disease of some part of the respiratory organs. This is called 'direct' cough as opposed to an 'indirect' cough, which sometimes arises from irritation of other organs not respiratory. The direct cough may occur in diseases of the larynx, bronchial tubes, lungs, pleura, or nose, and these headings should be referred to for further information. Indirect cough may arise from disease of the ear (wax in the ear being a common cause in small children), of the pharynx (including enlarged tonsils and uvula), or from enlarged glands in the chest or diseases of the heart and large blood-vessels. Chronic cough is not uncommon in those who follow dusty occupations or in heavy smokers, and then it is due usually to the pharyngitis provoked thereby. The character of the cough gives indications both for diagnosis and treatment, and in this respect there are three main varieties :

(1) The cough is dry. There is no expectoration, or what little there is will be brought up with difficulty. In common parlance, the patient is 'tight on the chest.' This is often the case in early stages of phthisis, bronchitis, asthma, pneumonia, pleurisy.

(2) The cough is loose. The expectoration may be excessive, and often is so in later stages of bronchitis, phthisis, and some other conditions, also under treatment with potassium iodide.

(3) The cough comes on in paroxysms, fits of coughing. This is especially the case in whooping-cough and in asthma and in emphysema, when the expectoration is scanty. But fits of coughing also occur when the expectoration is excessive and where it has been collecting for some time, as in phthisis with cavities in the lung. In such cases change in the patient's position often brings on a cough.

Fits of coughing may also arise from enlargement of the glands in the chest.

Besides the above main varieties, the cough arising from irritation of the larynx, directly or indirectly, is characterised by its dry hoarseness and ringing, brassy note. Many coughs are purely nervous in character and have become an unnecessary habit in some individuals ; while others, again, are

deliberate, such as the cough by which an Indian domestic warns one of his presence, or the nightly disturbance of the chowkidar.

A cough that comes every winter is usually due to chronic bronchitis, and tends to produce emphysema (*see* p. 168).

In the *treatment* of cough regard must be paid mainly to the condition that is producing it, and therefore the disease of which the cough is a symptom should be referred to. A good general principle is to consider whether the patient has any expectoration to cough up : if so, he should be encouraged to bring it up and expectorants should be given ; if not, then drugs that will make him spit will only bother him more, and he requires his irritation soothed instead.

For instance, in pleurisy, there being nothing to expectorate, give the soothing cough mixture No. 39 thrice daily. Also in pneumonia, at any rate in the early days of the disease do not give expectorants at all. For an ordinary bronchitic cough, not too tight on the chest, give Prescription No. 40 thrice daily. This will be found the most generally useful of cough mixtures. If the sputum is thick and sticky, add one or two grains of potassium iodide to each dose of Prescription No. 40 ; and if the phlegm be very difficult to bring up and causes much straining, then Prescription No. 56 thrice daily may be used. For any cough that is tickling and may hinder sleep, whether with expectoration or not, the compound linctus of Prescription No. 53, a teaspoonful at a time when required, will be found to give relief.

Cramp in the Legs. Cramp attacks suddenly, most often at night. The muscles of the calf are drawn into knots, which may be felt as hard lumps ; there is intense pain, and the parts often feel sore afterwards. Sometimes the thighs are attacked ; sometimes the small muscles of the foot.

The malady is most prevalent in elderly people, but also occurs to pregnant women. It is often caused by constipation, when a collection of faecal matter in the lower bowel presses on the sciatic nerve on its way down to the leg.

When it occurs to pregnant women it is usually caused by the pressure of the enlarged womb on the nerves. Constipation must be avoided by the appropriate remedies (*see* p. 151), and any dyspeptic symptom present should also be treated (*see* p. 160). Locally the best plan is brisk rubbing with salad oil and brandy in equal parts, or, if available, with soap and opium liniment. But in cases where the cramps

depend on pregnancy the rubbing should be gentle, as the enlarged veins generally also present during pregnancy might be ruptured by hard rubbing. A bandage or garter tied tightly round the leg above the seat of pain will often relieve cramp, but the bandage should not be permitted to remain on for longer than four or five minutes, and should not be used if there are enlarged veins.

Delirium. Delirium is a kind of temporary mania, a disorder of the mind, and is a symptom and not a disease in itself. It may vary in degree from slight wandering and incoherence to complete and thorough derangement of the mind. Frequently the patient has some fixed delusion. Delirium tends to be worse at night, or it may only come on at that time, during broken sleep. Delirium also arises from the weakness following continued bleeding, or from almost any cause of great exhaustion, such as bad burns, wounds, or compound fractures. It is often present during the course of fevers. Of this febrile delirium there are two forms—one occurring in the early stages of fever, often marked by great excitement, struggling, and displays of strength; the second form supervening in the later stages of fever, when the patient lies prostrate on his bed, utterly helpless and muttering indistinctly—a condition of low muttering delirium. Lastly, delirium is a symptom of inflammation or other disease of the brain, when the delirium is characterised by great fury and violence.

In most instances of delirium the patient will require to be restrained, so as to prevent his getting out of bed or otherwise injuring himself. Persuasion and gentle force, a soothing manner, combined with watchfulness, firmness and decision, are required from the attendants, for contradiction and the exercise of authority always excite opposition from the delirious. As a general rule, delirious people may be sufficiently restrained without mechanical means; but in exceptional cases, or when sufficient help cannot be obtained, the strait-waistcoat may be employed.

The strait-waistcoat is made of strong cotton cloth, and should extend from the neck to below the waist. It should have no opening in front, but tie down the back with tapes. The sleeves should be long enough to extend half a foot beyond the hands, and should be closed at the extremities, round which a cord or strong tape is tied. The waistcoat should also be furnished with shoulder-straps. When used, the tapes should

be tied down the back, and the cords or tapes attached to the sleeves may be tied to the foot of the bed if the patient's hands are required by his sides, or to the opposite sides of the bed if the hands are crossed over the body. Strong tapes or ropes, passed through the shoulder-straps and tied to the bed, effectually secure the patient's body.

A disease with delirium is so serious that medical aid must be obtained.

Delirium Tremens. This is the peculiar delirium of the drunkard, and presents certain characteristics, differing from any other kind of delirium. It is generally caused by continuous or prolonged drinking, but may follow a single indulgence in excess. Or it may come on after a person, habitually drinking, suddenly ceases doing so. Drunkards are especially liable to this delirium after a severe injury or when attacked by any disease. The patient is incoherent, and fancies he sees all kinds of frightful objects, rats, snakes, and strangely coloured dogs being the most common, especially at night; his hands tremble, his eyes wander, his pulse is feeble, his skin moist, he has no appetite, and he cannot sleep. The patient, however, is seldom violent, and may be generally controlled without force or mechanical restraint, although the reverse occasionally happens. But there is cunning with the delirium, and the patient may secrete such articles as razors or knives, so that he requires watching. Often the person exposes himself to injury by endeavouring to effect an escape from his attendants or from imaginary dangers. In fatal cases the delirium is succeeded by insensibility, in which state the patient dies after a period in which heavy breathing, twitching of the limbs, and involuntary discharge of fæces, with perhaps convulsions, are the most marked symptoms.

The mental delusions in delirium tremens are peculiar. The patient may declare there are snakes under his pillow, or he may be seen listening to the arm of a chair, which he believes to be a hissing serpent; or he may accuse a bystander of a design on his life, or imagine he is besieged by a party of soldiers; or he will pretend to be busy with his daily avocations, or imagine himself possessed of great wealth, which he will either hoard or distribute lavishly.

Delirium tremens must be distinguished from the delirium accompanying inflammation of the brain and its membranes. This is accomplished by a consideration of the history of the

ease, delirium tremens occurring in persons addicted to drink.

In delirium tremens there is an absence of headache, and light is not painful to the eyes, while the reverse obtains in inflammatory delirium. There is in delirium tremens as a rule an absence of febrile symptoms and a moist skin, the reverse being the case in affections of the brain. There is also generally a smell of alcohol with the breath and a furred and tremulous tongue. It sometimes, however, happens that delirium tremens occurs in persons who, while drinking hard, have also, from exposure to the sun or from fever, a congested condition of the brain ; in which case the symptoms may then be somewhat less characteristic than as above set forth. Loss of appetite for solids and want of sleep precede the attack. In doubtful cases, in the absence of medical aid, it will be best to treat the case as delirium tremens. Delirium tremens is not infrequently accompanied by pneumonia.

Treatment. Where possible a medical man should always be sent for, since delirium tremens is a serious disease and the remedies that it is necessary to employ are also not without their danger. Treatment should begin with a large dose of calomel, 5 grains, at once. In about an hour's time, if the patient is still restless, give 1 ounce of Prescription No. 29. If the patient is very violent, however, and if medical aid is at hand, it is better to give a hypodermic injection of morphia, $\frac{1}{2}$ grain instead of Prescription No. 29.

The patient must be in bed and be watched night and day, but do not tie him down unless absolutely unavoidable.

It may be necessary to give the patient a few ounces of brandy or whisky as a stimulant during the delirium ; but this should be stopped as soon as recovery begins. The diet should be fluid : eggs, milk, and soups in small quantities and at frequent intervals. When the attack is over give Prescription No. 52 thrice daily.

Diabetes. Since the last edition of this book there has been a great advance in our knowledge of this disease.

The disorder begins insidiously and is characterised by the passage of large quantities of pale urine which contains a particular kind of sugar, known as dextrose or glucose.

There is another variety of diabetes called diabetes insipidus where large quantities of urine are passed without sugar. This type of the disease is rare and will not be dealt with

Diabetes is due to a defect of the pancreas, which gland elaborates a product known as Insulin. This substance enables the body to store and utilise the sugars and starches of food, all of which are converted into dextrose before absorption from the alimentary canal.

When this substance is deficient, sugar is not utilised and accumulates in the blood and is excreted by the kidneys. At the same time other mechanisms become deranged and fats are not properly burnt by the body, and poisonous substances are formed. Owing to the loss of sugar the patient wastes rapidly, and owing to the accumulation of poisonous substances finally passes into coma.

When diabetes appears for the first time in those who have reached middle life, especially if they are obese, it is not as a rule a severe disease ; when it appears in the young it is very acute.

Diabetes is prevalent among the better class of Indians, in some apparently from habitual excessive consumption of starchy and sugary food and lack of exercise ; in others, mental strain appears to be a factor, as it is often the highly educated and those subject to worry who suffer.

The symptoms of diabetes are excessive thirst, weakness and rapid loss of weight. In addition, the patient will find that he has to pass more and more urine, having to get up several times at night in order to do so. The skin is always dry and as emaciation progresses the general health suffers, there is great debility, the heart becomes weak, and the feet may swell. Such cases sometimes end in a peculiar form of unconsciousness known as diabetic coma.

Diabetics are subject to various complications of which inflammation of the skin in the form of boils, carbuncles, or eczema of the genitals are the commonest. The resistance to other infections such as tuberculosis is much lowered and this disease is a common and fatal complication of diabetes. Pains in the nerves of the limbs and weakness of the legs, cataract and gangrene are also associated with this affection.

The *treatment* of diabetes has undergone revolutionary changes in the last 10 years. The discovery of Insulin and its isolation has rendered a disease that was previously extremely fatal, one that can be arrested indefinitely.

For the control of diabetes two factors are essential, control by a physician, and intelligent co-operation of the patient.

A patient who is self-controlled, who is intelligent and will persevere, will be to all intents and purposes cured of his diabetes. This disease is one of the few which it is advisable for the patient to study in conjunction with his doctor from a technical point of view. In order to do this he will be recommended some book on the subject, such as "The Diabetic Life" by R. D. Lawrence (J. & A. Churchill). Here it must suffice to give the general principles of treatment.

For mild cases and elderly diabetics, it might be sufficient to cut down the diet. This is done by starving the patient for two days or until he is no longer passing sugar in the urine and then building up the diet day by day, until the maximum diet is reached on which he remains free of sugar.

For the more severe cases the use of Insulin is imperative, a diet is given which is worked out according to the minimum requirements of the patient, and sufficient Insulin is injected twice a day to keep the urine free of sugar. The diet is then increased up to the point at which it contains the necessary energy for the patient's particular avocation. Intelligent diabetics soon learn to inject themselves and to arrange and weigh their own diet.

The other points of importance in the treatment of this disease are the eradication of all septic points in the body such as bad teeth, tonsils, etc., and to avoid all exposure to colds, influenza and other infections.

In advanced untreated diabetes, or in diabetics suffering from infection, there is the liability to coma. In this condition the patient becomes drowsy, and finally unconscious. The condition is a medical emergency and requires urgent medical attention. For this reason it is very unwise for diabetics to live out of reach of medical aid.

Dropsy. Dropsy is a consequence and symptom of other diseases. Dropsy consists of swelling caused by the escape of the watery portion of the blood through the coats of the vessels into the surrounding tissues. This is often produced by some impediment to the circulation of the blood causing stagnation of that fluid, as, for example, swelling or dropsy of the leg may be caused by a tight ligature, as a garter, if allowed to remain sufficiently long. Dropsy may also be caused by changes in the circulating blood, as in kidney disease; or by a watery condition of the blood, as in anæmia.

The most usual positions of dropsy are the lower extremities and the belly. It may, as in diseases of the kidneys or heart

affect the face or the entire body. The malady is recognised when external by the parts affected 'pitting' on pressure: that is, if pressed upon by the fingers depressions are left which only gradually fill up.

Dropsy is generally connected with, and traceable to, one or other of the following conditions: (a) Disease of the kidneys; (b) Disease of the heart or lungs; (c) Disease of the liver or spleen; (d) Disease of the peritoneum or membrane surrounding the bowels; (e) Anæmia; (f) Diseases of nutrition.

(a) *Dropsy from disease of the kidneys* begins generally in the loose structure of the eyelids and privates, the feet and legs quickly becoming affected. The forehead will be found to pit on pressure.

(b) *Dropsy from disease of the heart or lungs* will begin in the feet first if the patient is up and about; but usually in the belly first if the patient is in bed. It spreads, and in course of time may involve the whole body.

(c) *Dropsy from liver or spleen disease* first affects the belly, which swells, and may be felt to contain fluid; a condition called *ascites*. But ascites is not always due to disease of the liver or spleen, though that may be present, but to:

(d) *Disease of the peritoneum*. It is the chronic inflammation of the peritoneum covering these organs that is responsible as a rule for the watery outpouring in the belly, and because of its pressure on the big veins in the belly for dropsy of the feet and legs as well. The peritoneum may similarly cause dropsy of the belly in tuberculous disease, or in cancer, or from the irritation caused by the presence of any other tumour there.

(e) *Dropsy due to anæmia* is usually seen only in the feet and face; but in severe anæmia may be more extensive. See *Beri-Beri* p. 44.

Dropsy is therefore due in the great majority of instances to some organic internal disease, meaning thereby some disease involving change of structure in the parts implicated. The treatment of dropsy must therefore be that of those diseases of which it is a prominent symptom.

Ascites, however, may be tapped with great temporary relief, sometimes apparently with permanent benefit. Dropsy of the interior of the chest or thorax, usually due to heart disease, may also be tapped with relief to the heart and the general symptoms. In a few cases even ascites may be permanently cured by an operation.

Dyspepsia. Indigestion in one or other of its numerous forms is very common in India, sometimes occurring as a simple dyspepsia unconnected with any other malady; at other times as the result of disease of the stomach, liver, or bowels, temporary or permanent. Dyspepsia is, therefore, in various instances, a symptom of other maladies, and not the primary disease.

Before dyspepsia can be properly understood it is necessary to have some idea of the process of digestion and of the organs concerned, and for this purpose the part of Chapter II which deals with the processes of normal digestion and the nature of foodstuffs should be read here. It will be understood from this that a defect in the process may arise at any part of the alimentary tract, starting from the deficient mastication due to want of teeth down to sluggish action of the large intestine. Indigestion is due usually either to defect in the stomach digestion, gastric dyspepsia, or to defect in the intestine, intestinal dyspepsia. Intestinal dyspepsia shows itself as a rule by such symptoms as colic, diarrhoea, or constipation, and to those headings the reader is referred for a further account. What follows here deals alone with gastric dyspepsia, which is the commoner type.

Gastric Dyspepsia may be either A., an *Acute* and sudden event of short duration; or B., *Chronic* and of long standing.

A. *Acute Dyspepsia* is also of various kinds.

I. In some cases the first symptom is violent headache, which, after lasting some time, is relieved by vomiting. The patient gets to discover this fact by experience, and so is inclined to encourage vomiting by tickling the back of his throat. This type of dyspepsia is really a *migraine*, and the section on Nervous Headache should be read in reference to this. The best means of dealing with such dyspepsia is to wash out the stomach (see p. 601); failing that vomiting should be induced by one of the emetics mentioned in Chap. VII. These attacks often occur periodically: when expected they may be sometimes averted by a course of Prescription No. 57. 1 ounce morning and evening; while the powders recommended for nervous headaches on p. 184 will often give relief at the time.

II. Another form of acute dyspepsia is an inflammation of the mucous membrane lining the stomach and is called *Acute Gastritis*. In this case the first symptom will be

discomfort at the pit of the stomach, followed by increasing pain and tenderness at that place, with constant hiccough, nausea, and vomiting, even water being rejected. The vomit consists of thick, mucous fluid, often tinged with bile; the breath is sour, the tongue furred in the centre, with great thirst and much feverishness, and the mouth may be sore. It is to this condition that the term *gastric fever* has been applied. But a disordered stomach will usually recover itself in the course of two or three days, and it is best to avoid the term *gastric fever*, and give the disease its scientific name of *acute gastritis*. Acute gastritis may occur in the course of chronic forms of dyspepsia from undue irritation of the stomach; when it occurs by itself for the first time it is usually due to something in the quality or quantity of the food or in its temperature that has given rise to intense irritation. Mere excess of the food is sufficient, though more often some putrefaction is the cause, especially in the case of fish or tinned foods. An excess of ice-cream or cold drinks may induce gastritis; and so may a bout of alcoholic drinking. Certain irritant poisons especially ARSENIC give rise to a very acute gastritis, of sudden onset. There will be very intense vomiting and acute tenderness and pain in the upper part of the abdomen. Many cases of alimentary disorder arising from bad food are of the nature of a gastro-enteritis, diarrhoea and purging being added to the symptoms of stomach inflammation. Diseases of the heart and liver are apt to render the subject prone to attacks of gastritis.

The *treatment* of acute gastritis should consist in absolute starvation by the mouth for twenty-four hours or longer. Warm water by the mouth may be allowed, however, and after forty-eight hours if vomiting has ceased give a tablespoon of iced milk every hour. From this advance may be made to egg albumin, whey, and Bovril. No cooked meats should be given for a week. At first washing out the stomach (*see* p. 601) usually has a good effect on the vomiting. This may be effectively done by making the patient drink a number of tumblers of warm water with a pinch of sodium bicarbonate (cooking soda) added. The patient will vomit this and the sodium bicarbonate will loosen the mucus and then the stomach will be cleared out and the nausea relieved. After that give 2 ounces of Prescription No. 60. To allay nausea and retching give 1 ounce of Prescription No. 42 every four hours, to which 5 minims of liquor morphinæ may be added if and so long

as there is much pain. A hot fomentation on the pit of the stomach will also relieve pain.

B. *Chronic Gastric Dyspepsia* may be of several varieties, and their methods of operation may be very complicated. It is important to realise this, because at first sight one might think that because we can make gastric juice artificially, and can digest food with it in a test-tube, that all we should have to do if digestion did not proceed correctly in the stomach would be to drink some of this gastric juice and let that carry out the processes. But that is far from being the case, because the stomach is unlike a test-tube in many ways, and the factors influencing its work are many and complicated. When any one of these factors does not operate the work of the others is interfered with.

We give here the commonest varieties of chronic dyspepsia in as simple a form as possible.

I. There is *excessive secretion* of gastric juice.

II. The muscle of the stomach-wall loses its power : this is called *Atony of the Stomach*.

III. There is chronic inflammation of the mucous membrane lining the stomach : *Chronic Gastritis*.

IV. The nervous mechanism of the stomach and perhaps of the whole body is deranged : *Nervous Dyspepsia*.

I. There are again two principal varieties of the dyspepsia characterised by *excessive secretion*.

(a) In one variety the secretion contains an unusually high proportion of hydrochloric acid, the acid of the gastric juice ; but the excess of gastric juice is only poured out during digestion. This is called *hyperacidity*.

(b) In the other variety the excess of secretion is continuous even when the stomach is empty and when there is nothing to excite the flow of juice.

(a) *Hyperacidity* is a very common form of dyspepsia, especially amongst the better classes who get plenty to eat. The subject of this form may appear well and strong and have a good appetite. This dyspepsia is sometimes due to excess of food, especially in proportion to the amount of physical exercise taken. Or it may be the quality of food that is at fault. There are certain articles of food that excite the flow of hydrochloric acid in the juice ; such are spices, meat extracts as soups, alcohol, and aerated waters. These, as well as tea and coffee, help to produce hyperacidity. Insufficient mastication of the food is sometimes a cause ; so also are exhausting

conditions and worry. The disease is not uncommon amongst vegetarians, and sometimes is associated with ulcer of the stomach.

As a rule pain or discomfort are not felt until one to three hours after a meal, and then are felt in the pit of the stomach, especially after the midday meal. From thence the pain may spread over the belly, sometimes more on the left upper side, and may reach round to the back, sometimes being felt in between the shoulder-blades. There is a feeling of fulness in the pit of the stomach, ending often in acid eructations, which give relief. Vomiting is uncommon; if it does occur, it gives immediate relief. There is always flatulence, usually more than an hour after food. In the *treatment* of hyperacidity the first essential is to avoid worry, and the other causes given above, that predispose to this dyspepsia. Make sure that the teeth are efficiently masticating the food, and do not eat in a hurry. In the matter of diet avoid any of the acid-excitors mentioned above; avoid also indigestible foods, especially nuts, fruits, and salads. Milk is excellent; and if the condition is severe milk should be relied on alone. In severe cases half a pint of milk should be given every half hour, and in each half pint 15 grains of sodium citrate. From that the patient can advance on to oatmeal, sago, and boiled fish. No bread or toast to be allowed. Salt is to be reduced to a minimum, and is better omitted altogether. Certainly no condiments of any kind. As the patient gets better potato may be taken, and poultry and a little cauliflower. But not cabbage, lettuce, peas, beans, carrots, turnips, fruit, or nuts. Butter and cream are allowed. Fluids in moderation are allowed at the end of a meal. For medicine bismuth lozenges may be sucked after meals. In mild cases this will be sufficient. If the hyperacidity is more severe give Prescription No. 42, 1 ounce thrice daily, two hours after meals, and if there is much pain add 5 minims of liquor morphine to each dose.

If there is constipation, 2 drachms of sodium sulphate in water in the early morning should be taken.

(b) When the secretion of gastric juice is continuous, irrespective of the presence of food in the stomach or not, the condition is called *hypersecretion*. This disorder may come at intervals in an acute form or be chronic. It usually begins at intervals and later becomes permanent. It is associated with hyperacidity. Pain is always present, and it is like the

hyperacidity pain already described, though it has peculiarities of its own. One is that it is apt to come on before a meal. When this occurs with a sinking at the pit of the stomach it is called a 'hunger pain'. Another is that night attacks are frequent, usually between 1 and 3 A.M.; the later the dinner the later the pain. Extreme discomfort due to distension often wakes the patient up at that hour. He gets relief by belching, or better still by vomiting. Another feature of hypersecretion pain is the relief given by a little food, such as milk or a biscuit. Many patients find this out for themselves and carry biscuits about with them. There is usually great thirst and constipation and often vomiting. There is always flatulence, and often acid eructations occur, especially at night. One difference from hyperacidity is that the patient does not look so well as a rule: he always loses flesh.

The importance of hypersecretion is that its presence is only a symptom of some serious organic lesion in the bowels, usually a gastric or duodenal ulcer, or appendicitis or gallstones. A physician should always be consulted when the above symptoms occur, because palliative *treatment* such as described below, though often successful in giving comfort to the patient, does not aim at removing the cause of the disease, and some cases may require surgical treatment.

The principles regulating the diet in this condition as well as in hyperacidity and gastric and duodenal ulcers, are as follows:—(1) Those articles of diet must be excluded that stimulate the production of gastric juice. Therefore all soups, meat extracts and in the early stages of treatment, red meats must be avoided. All condiments, curries and highly seasoned foods. Tea and coffee except well diluted with milk, all fried foods and alcohol.

(2) All articles likely to irritate the lining of the stomach, such as raw salads, nuts, carrots and legumes, if not reduced to a purée by careful sieving.

(3) Those foods that are bland, and neutralise the acid in the stomach should be partaken of freely. Milk, eggs, cereals, purées and later minced mutton, chicken and fish.

The meals should be frequent and some hot milk and ovaltine should be available in a thermos flask at night.

For medicines Prescription No. 66 may be freely used. The dose of the Magnesium carbonate may be regulated according to whether the bowels are too free or constipated, this substance

being a mild aperient. This powder should be taken last thing if there is pain during the night.

It should again be emphasised that abdominal pain occurring after or before meals, and especially if waking the patient at night should be investigated by a physician, as peptic ulcer is a common cause and will require systematic medical treatment, or even operation for its permanent relief.

II. *Atony of the Stomach.* In this condition the wall of the stomach loses its strength and elasticity, so that besides not being able to churn the food up and so promote digestion and to propel it onwards into the intestine, it also becomes unduly distensible. The food therefore is liable to stagnate and decompose in the stomach, and later the stomach may become permanently dilated.

This is a common variety of dyspepsia, especially amongst the poorer classes, and more so in women than in men. It sometimes comes on after other illnesses, such as fevers, where the stomach is left weak like the rest of the body. Too frequent meals especially those containing much liquid or starchy food, and excessive tea drinking tend to this dyspepsia: so also does residence in a hot climate.

When the movements of the stomach have been sluggish for some time and the food is beginning to stagnate there, the principal feature will be discomfort or pain beginning as soon as food is taken; not, as in the varieties already described, one or two hours after meals. The pain that begins just after a meal commonly reaches its height in an hour or two, though in this there is much variation. A feeling of weight is felt behind the breastbone or between the shoulder-blades, and there is much distension of the stomach. This is more noticeable after fluids than after solids, because they are more bulky. Belching is a constant symptom, usually within an hour of meals. Vomiting is uncommon. The appetite is small and sometimes capricious, and constipation is always present. There is often an aversion to fluids, especially to milk. The tongue is broad, pale, flabby and often indented by the teeth. There is often palpitation after meals if the disease is allowed to progress, and the stomach may become dilated, and vomiting may occur.

There is no tenderness or pressure over the upper abdomen, a point which distinguishes it from chronic gastritis and other organic diseases of the stomach.

In the *treatment* of atony of the stomach much benefit

may be obtained from massage if intelligently performed. One skilled in the art should be consulted. A useful movement is by pressing the tip of the thumb on the centre of the stomach (not of the belly) and, using the thumb as the centre of a circle, making brushing movements with the finger-tips. This should be done night and morning for ten minutes.

As regards diet, fluids and bulky foods are to be avoided. No milk, tea, coffee, beer, or wines. A little whisky at meals is allowable. Avoid much of the sweet dishes. No green vegetables or fruit, nor excess of fats and butter. Eggs and boiled fish are allowed. Fluids should be taken between meals.

At the beginning of treatment give 1 ounce of Prescription No. 42, to which 10 minims of glycerine of carbolic acid have been added, twice daily in between meals. If the tongue is foul give Prescription No. 57 instead.

After the first week or ten days of this treatment, and if the tongue is now clear, give 1 ounce of Prescription No. 33 or No. 34, to which 5 minims of tincture of nux vomica have been added, thrice daily with or immediately after meals. If anæmia is a feature give Prescription No. 52 immediately after meals instead. A little extract of malt with meals is also useful. If constipation is troublesome a large enema twice a week will keep the bowel clear: or cascara may be taken with the malt extract.

III. *Chronic Gastritis* is a form of dyspepsia not uncommon in the aged. It is commoner in men. About half the cases arise apart from disease elsewhere, i.e., are primary, whilst the other half are secondary to serious disease of other organs, such as the heart, lungs, or kidneys, and are therefore best treated by attention to those organs. In the primary form the commonest causes are septic teeth, alcoholism, especially spirit drinking and abuse of tobacco. Deficient mastication and hurried eating are also causes: as also are the abuse of tea and coffee, highly spiced foods, and condiments, and the taking of iced drinks in large amounts.

Chronic gastritis in the East is frequently associated with chronic dysentery, it is also a feature of sprue. Many persons in the East who suffer from chronic dyspeptic symptoms have deficient gastric secretion.

The disease begins insidiously, with discomfort during digestion, distension of the stomach, belching, nausea, and

great lassitude. Vomiting may occur at times, and in the alcoholic form is especially common in the early morning. The bowels are irregular; there is usually thirst, often headache, always depression. Thirst is frequent, and a bad taste in the mouth at times. The discomfort is felt at the pit of the stomach and usually about an hour after meals. The breath is sometimes offensive. The appearance of the tongue varies, it is usually coated with a thin fur, moist, and flabby. The appetite is capricious; there may be an increased desire for spiced or salted or acid articles of diet. Belching during digestion is a very common feature.

The best *treatment* of chronic gastritis consists in avoiding those things that predispose to it that we have mentioned above. The teeth should be attended to, the stools should be carefully investigated for evidence of dysentery or worms and the history of attacks of diarrhoea alternating with constipation sought for. Where vomiting is a feature or excessive belching, lavage or washing out the stomach should be resorted to. This should be done morning and evening for ten days with water at about 65° F. containing 1 grain of sodium bicarbonate to the ounce. As regards diet no definite rules can be given because cases vary so much in their digestive powers. The food should be bland, and in severe cases should be given three hourly.

Dilute Hydrochloric acid in teaspoonful doses in a tumblerful of orange juice and water sweetened with a little sugar, to be taken *with* the principal meals or Prescription No. 33 may be used.

Milk is very good if it agrees. For medicine, residence at a mineral spa is extremely useful, though the discipline and course of treatment can be adopted without the necessity of travelling to one. If alcoholism is the cause, 15 grains of chloretone twice daily in capsules may benefit. To stimulate appetite lavage is most useful, or a little beef tea or hot water fifteen minutes before a meal. Constipation must be avoided, and for this an early morning saline draught is best, equal parts of sodium sulphate and phosphate in a tumbler of water.

IV. In *Nervous Dyspepsia* the symptoms may be as mentioned under one of the other forms of dyspepsia, more resembling those of atony of the stomach, except that they occur at irregular intervals and are accompanied by other nervous phenomena, especially depression. In some cases, usually

women, there is falling down of the stomach or bowels to a lower level; this is called *gastroptosis*.

Nervous dyspepsia is really a variety of *neurasthenia*, where the stomach occupies the first place in the general nerve upset. It is commoner in women and in the better class of Indians, male and female. The *treatment* should be more general than directed to the stomach alone. A change of scene, freedom from worry, or suitable exercise may be the thing required to put matters right. In very severe cases a rest cure may be necessary (*see p. 598*).

It is impossible to lay down detailed rules; each case must be treated on its own merit.

It may be of help to give here a list of the average periods of digestion of some of the commoner foods in a healthy stomach. Too much reliance, however, should not be placed on these figures, because individual differences are marked, not only in health, but more so when the digestion is deranged. Besides, apart from individual differences the periods of digestion given may be greatly changed by disease of the digestive organs, and may be more changed for some foods than for others.

TABLE OF TIME NEEDED FOR NORMAL DIGESTION

Beef, boiled . . .	3 hours	Cheese . . .	3-4 hours
" roasted . . .	3-4 "	Apples . . .	3-4 "
Fish, boiled . . .	1½-2½ "	Cabbage . . .	3½-4 "
Lamb . . .	2½ "	Carrots . . .	3-3½ "
Mutton, boiled . . .	3 "	Potatoes . . .	2½-3½ "
" roasted . . .	3-3½ "	Turnips . . .	3½-4 "
Pork, roasted . . .	5 "	Oatmeal . . .	} well cooked 1-2 "
Poultry, boiled or roasted	2½-4 "	Rice . . .	
Tripe . . .	1 hour	Sago . . .	
Veal, roasted . . .	4½ hours	Tapioca . . .	
Hen's eggs, raw . . .	1½ "	Arrowroot . . .	
" fried or boiled . . .		Wheat bread . . .	3-4 "
" hard . . .	3-3½ "		

Emphysema of the Lungs. The lungs are composed of a vast number of air cells. Emphysema signifies the excessive dilatation of these air cells, and their eventual rupture into each other. The excess of air which constitutes ordinary emphysema of the lungs is in the 'air sacs'—*vesicular emphysema*. Emphysema occurs in connection with, and may be caused by such maladies (*chronic bronchitis and asthma*)

as are attended by violent or prolonged cough. The straining consequent on whooping-cough may lay the foundation of future emphysema. It may originate from violent athletic exercises, which necessitate holding the breath long. It may also be induced by playing on wind instruments. But in the majority of cases there is hereditary predisposition. When emphysema occurs the lung tissue loses elasticity, and acts slowly, the air not being properly expelled. The consequences are: difficulty of breathing, especially on exertion, and cough with expectoration of a thin character. There is no acute pain, but a feeling of oppression in the chest, and often 'asthmatic' attacks. As the disease grows worse the blood is imperfectly purified, or aerated, and the countenance may become dusky, especially the lips. The breath is inspired, in a peculiar manner, shortly and quickly, followed by prolonged, and wheezing, expiration: the nostrils often dilate with each inspiration. There is frequently in advanced cases some swelling of the feet and ankles of a dropsical nature, and, as the disease grows worse, the voice becomes feeble, the body wastes, and more decided dropsy may ensue. Emphysema of the lungs is always accompanied by chronic bronchitis and 'winter cough,' and is usually complicated by affections of the heart and asthmatic attacks.

Treatment. When the lung cells have broken into each other the condition is incurable. But much may be done to alleviate by careful diet, as mentioned under Asthma, especially by avoiding articles which cause flatulence; and most of all by residence in a warm, humid, and equable climate, such as may be obtained at most of the seaside resorts in India, as well as at many of the downcountry stations.

Violent exercise must be avoided, as well as exposure to cold night air; and the sufferer should be warmly clad. The potassium iodide mixture, Prescription No. 56, 1 ounce thrice daily, will be beneficial; or 2 grains of potassium iodide in each ounce of Prescription No. 40.

For asthmatic attacks see under the heading of that disease, and read also the section on Bronchitis.

Epilepsy. Epilepsy is often called 'the falling sickness,' or commonly 'fits.' Epileptic fits vary in character, severity, and duration. A very minor degree of epilepsy often occurs, the 'little evil' (*petit mal*). There is a momentary staggering, or peculiar sensation, or transient loss of consciousness; the person stops doing what he was about for a few seconds, and

there may be a spasm or convulsive movement of a limb. Between such slight epileptic manifestations and the typical seizure described below, there may be infinite modifications. The 'little evil' is nevertheless a serious disease.

In epileptic subjects the fit is very often preceded by a period during which unusual conditions give notice that an attack is likely to occur. There may be dyspepsia, irritability, or excitement; headache and constipation. Vigorous treatment at this time will sometimes ward off an attack. More immediate warnings are of a very varied and interesting nature. They are known as epileptic auræ. These auræ may begin in the limbs, in the head, or in the organs of the special senses. There may be giddiness, a feeling of nausea, specks before the eyes, a bad smell evident to the patient only, buzzing in the ears, twitching or creeping sensations beginning in hand or foot and passing up the limb. These auræ in the limbs may occur on both sides of the body or be confined to one limb. As a rule, each sufferer has his own form of aura, but this is not always the case, the aura changing at different times. In about half the cases there is no aura or warning at all.

The symptoms of an epileptic fit are as follows: After a short warning, the patient is seized with loss of consciousness and loss of power, so that, if standing, he immediately falls to the ground. Or he may fall without any previous warning. The fit is often preceded by a loud cry, and consists of strong convulsive movements of the limbs and trunk, with spasms of the muscles of the face and eyes, producing distortions of the countenance. Sometimes, the first spasm twists the head round so that the sufferer appears to be trying to look over his shoulder. The brows are knit, the eyes fixed and staring, or turned up beneath the lids, so that only the whites can be seen. The eyeballs roll, and the pupils are dilated and insensible to light, but commence to oscillate towards the close of the paroxysm. The face is at first pale, afterwards becoming red. The skin is cold and clammy. The hands are clenched, and the arms tossed about. The breathing is difficult, generally noisy, or may appear arrested, as if the person were unable to breathe. The teeth are clenched, and foam (often bloody, from the tongue being bitten) issues from the mouth. The fæces and urine are often expelled involuntarily. After the convulsions have continued from one to two minutes, or even, in exceptionally severe cases, several

hours in which case there are series of fits without recovery of consciousness in between, the patient becomes motionless and remains almost insensible; or looks round with a bewildered expression, and generally sinks into a profound sleep. Fits, of a greater or less degree of violence, may occur almost daily, or at intervals of months or years.

In many cases of epilepsy there is a neurotic family history a history either of epilepsy itself or of some other nervous complaints. Those who have been subject to convulsions in infancy (see Chap. XVII) are more likely to be epileptic in later life. In only a few cases can a definite cause be found, such as the pressure of a fragment of bone, after an injury to the skull, upon part of the brain matter or brain tissue. In his minority of cases surgical operation may cure the disease. Epilepsy usually begins in youth; less commonly after the age of twenty. If it begins before the age of seven years it is likely to affect the subject mentally to a greater or less extent.

Epilepsy may have to be diagnosed from hysterical fits. The chief distinctions are here tabulated:

EPILEPSY	HYSTERIA
<i>Preliminary</i> One cry.	Many shrieks.
<i>Fall</i> . . Sudden, may hurt himself.	Sinks to the ground safely.
<i>Urine</i> . . Often passed during fit.	Not so.
<i>Tongue</i> . . Often bitten during fit.	Not so; but lips may be
<i>Struggling</i> . Without purpose.	Often fights with those around.
<i>Presence of others.</i> Fits occur at any time.	Usually occur when others are present.
<i>Duration</i> . A few minutes.	Often a long time.
<i>Fits</i> . . Typical, as described.	Often peculiar attitudes adopted, such as that of a cross.
<i>Injury</i> . May hurt himself, never others.	May try to bite or injure others.
<i>Sex</i> . . Either.	Commoner in young women.

Treatment. During a fit the patient should be placed on his back with the head slightly raised. Fresh air should be admitted freely, and the face should be fanned and freely drenched with cold water. No treatment is so certain as this drenching with cold water. The neck and chest should be bared, cravats, stays, and all tight strings or garments about the body being loosed. The patient must be prevented from

hurting himself. Support his head, and after wrapping a piece of wood or any other hard material in a handkerchief, hold it in his mouth to prevent biting of the tongue. Do not forcibly restrain his limbs ; prevent him from hurting himself by pulling him away from a source of danger, such as machinery, a wall, or fire-place ; light pieces of furniture should be pushed out of the way.

The treatment of epilepsy in between fits is both medicinal and hygienic, and success therein lies in attention to details. The medicinal treatment consists in the administration of regulated doses of bromides, usually potassium bromide, as given in Prescription No 55. The drug may be given twice or thrice daily according to the time of the fits ; it being better to anticipate a fit by a dose shortly before the expected time if possible. So much bromide should be given as just to keep the fits in abeyance, and a bit more ; this may vary from 10 to 60 grains a day. When cure is apparent, the dose must be reduced very gradually, and treatment must be persisted with for at least 2 years. An epileptic should lead a very quiet daily life, if possible in the country. All excitement is to be avoided ; but the patient should not be allowed to idle or to day-dream. A mechanical occupation is advisable. Diet must be simple and plain. Meat must be taken only in moderation, if at all. No alcohol or coffee can be allowed : only very weak tea. Sometimes a fit can be warded off by force of will : by the patient clenching his teeth or by grasping something tightly, such as his own arm. Attempts at such control are to be encouraged. Sometimes inhalation of amyl nitrite from a capsule will arrest the onset of a fit. Other drugs are useful in epilepsy but these should only be given under medical advice. In all cases of epilepsy a doctor's assistance should be sought for controlling the treatment.

Epilepsy, Feigned. Epilepsy is sometimes feigned, but an impostor does not fall violently, but throws himself down carefully so as to avoid injury. The eyes are closed, instead of being fixed and staring ; the pupils contract on being exposed to light ; the tongue is not bitten ; the face is red instead of pale ; the skin is hot from the necessary exertion ; and neither urine nor fæces are voided. Under such circumstances the best thing is to take no notice of the patient.

Fainting or Syncope occurs from numerous causes. It may result from loss of blood, or from sudden shock ; it may

be produced by a blow over the stomach, or by intense pain ; or it may be connected, in women, with irregularities of the monthly flow. It may be caused by a disordered stomach, or may rarely arise from certain diseases of the heart. It may even arise from great heat, or the vitiated air of crowded rooms ; bad smells or unpleasant sounds. Persons most liable to fainting are young women, and young men of nervous temperament. The first symptoms are giddiness, swimming in the head, and pallor. A person in a deep faint is pale, unconscious, with feeble pulse, dilated pupils, relaxation of the limbs infrequent, irregular scarcely perceptible breathing, pale lips and extremities, and a death-like countenance. The body should be *at once* 'placed in the recumbent position,' the head being allowed to hang down lower than the body ; cold water should be dashed on the face and cold air admitted into the room, or the person should be taken out of doors. The limbs should be well rubbed, and a burnt feather should be held smoking under the nose, a better remedy than ammonia. If a feather is not at hand, smelling-salts may be held to the nostrils for half a minute, every two or three minutes ; strong salts should not be applied continually, as injury to the nostrils may arise therefrom. The subsequent feeling of langour will be relieved by rest. For the *prevention* of a fainting fit, lying down at full length, without a pillow under the head is recommended ; or if not able to lie down, the head should be bent forward between the legs. Persons subject to fainting usually require tonics and *outdoor exercise*, and should avoid constipated bowels. If the patient is held for a few seconds inverted so that the blood runs to the head, recovery will often follow at once. Fainting due to a temporary disorder of the circulation as above described, must be distinguished from similar attacks of unconsciousness due to mild epilepsy, *i.e. petit mal*, see p. 172. *Petit mal* should be treated as epilepsy. Sometimes hysteria (p. 195) may give brief periods of unconsciousness, which are not syncopal or true fainting fits. It is usually evident from the nature of the attacks and of the patient which kind it is, and the treatment should be carried out accordingly.

In persons over middle age attacks of syncope may be due to heart disease, and such individuals should be always examined by a doctor.

Feet, Burning of the. This is not a very common, although often a very troublesome affection. It occurs both

to Indians and Europeans, but rarely to the latter. It may range from an uneasy sensation of warmth in the soles of the feet, sometimes in the palms of the hands, to the most painful sensation of burning in feet and legs, preventing sleep, and thus destroying the general health. There are usually distinct periods of increase and diminution of the burning, neuralgic pain. In some instances the part affected is moist, in others quite dry. Emaciation and debility accompany the progress of the malady. It sometimes occurs unconnected with any other malady; at other times it appears as a sequela of fever, bowel complaint, or neuritis.

Treatment. Bathe the feet at night in strong brine, or in alcoholic spirit. Take quinine (Prescription No. 36), about 10 grains daily. Change of climate is a valuable remedy.

Fits. The term 'fit' is commonly used to signify almost any sudden attack; especially such as apoplectic, epileptic, fainting and hysterical. These are treated of in the order named under the appropriate sections.

Flatulence. Flatulence is an accumulation of gas, a symptom of dyspepsia, to which the reader must refer.

Gall-stones. Gall-stones are small concretions that form in the gall-bladder. Their formation is favoured by sedentary habits, want of exercise, and dyspepsia. They are more common in women than in men, and especially in the middle-aged. Very often their presence gives rise to no symptoms at all. Usually, however, there is dyspepsia with a feeling of weight or oppression at the pit of the stomach, and flatulence. Sometimes, too, gall-stones give rise to the variety of dyspepsia called 'hypersecretion,' an account of which is given on p. 162. It is, however, when the gall-stones leave the gall-bladder and tend to pass down the bile duct to the intestine that prominent symptoms may ensue. The pain that occurs at this time is called biliary colic, and is very severe. A small stone may pass through the tube without causing any, or only slight, pain; many such have been seen in the stools. A large stone, however, causes sudden attacks of shivering, and excruciating pain, immediately to the right of the pit of the stomach, shooting to the back, with vomiting, at first the contents of the stomach, and then sour bile. There is occasionally sudden jaundice, when the stone blocks the main duct. In the absence of bile the stools will be clay-coloured. If a small stone remains impacted in the duct the flow of bile is prevented, but not altogether stopped, and jaundice comes on more

slowly. From the pain mentioned above there are intervals of comparative ease, and pressure will, to a certain extent, relieve it, the person throwing himself about the bed, or pressing his thighs on the belly to get relief from change of posture. This distinguishes the malady from inflammation, when pressure and motion are painful. After a period of agony the stone may pass and the attack cease, to be followed by others. In exceptional cases an impacted gall-stone may excite inflammation of the parts, producing an abscess or an ulcer opening into the gut or stomach. And a gall-stone 3 to 4 inches in circumference may sometimes cause obstruction of the bowels.

The passage of gall-stone, or biliary colic, may be mistaken for the passage of stone from the kidneys, or renal colic, especially if the right kidney is affected. The distinctions are as follows :

RENAL COLIC

BILIARY COLIC

Pain in loins, usually on one side.	Not.
Pain shooting from loins down the groin and thighs.	Pain to right of pit of stomach, shooting to the back, sometimes right shoulder.
On either side, rarely both.	Pain most on right side.
Testicles drawn up.	Not.
Frequent desire to make water.	Not.
Making water may be painful.	Not.
Water scanty, high-coloured, or bloody.	Not altered.
Previous history of gravel, gout, or rheumatism.	Previous history of gall-stones, jaundice, and pale stools.
More common in men.	More common in women.

In cases of doubt the X-rays may be employed to assist diagnosis, as a kidney stone and a gall-stone can usually be made visible by their aid with modern methods of radiology.

The *treatment* of gall-stones depends upon the severity of the symptoms to which they give rise. In every case where their presence has been diagnosed the question of operation must be considered and a surgeon consulted for that purpose. No medicines can dissolve gall-stones in the body : some claim to do so, but they are inefficacious. When biliary colic occurs the stones should be removed by operation. During an attack and until operation, a hot bath may be given to the patient, and hot fomentations (p. 576) applied over the liver. It is usually necessary to employ morphia, of which $\frac{1}{2}$ grain may be given hypodermically by a doctor. At

the end of an attack the feces passed should be examined for gall-stones, by washing the stools through muslin or through a sieve. Gall-stones are brown or greenish-yellow in colour, are round or oval, or where several have been in the gall-bladder rubbing together, they may present flattened facets. They vary in size, from that of a millet-seed to that of a racket-ball. It is always desirable to ascertain whether gall-stones have or have not been passed, because if a single stone comes away *smooth and round*, it may be assumed there are none left behind, and that the trouble is over. Persons subject to gall-stones should always keep the bowels well open, for which a morning saline draught is recommended. Gall-stones may give rise to other complications, such as abscess or inflammation of the gall bladder, for which a surgeon should be consulted.

Giddiness. *Giddiness* or *Vertigo* is a symptom of disease characterised by the apparent movement of surrounding objects, or by a sense of falling backwards, or by both these phenomena. The term giddiness is also applied more loosely to the sensations that commonly usher in a fainting fit, such as a sense of dimness or darkness, and perhaps sounds of bells, or drums, in the ears. There is loss of power to balance the body, with more or less mental confusion. *Vertigo* varies much in intensity, and may be frequent or occasional. In many cases it is only felt on movement, as on rising quickly, or in certain positions, as when the head is hanging down. Giddiness may occur as a symptom of simple anaemia or debility; or as a premonitory to a fainting fit. Or it may be connected with disordered stomach, indigestion, or gout. It may arise from excesses of various kinds, from tobacco, alcohol, and from too much mental work. It often occurs to women at the 'change of life'. In other instances it may be premonitory of epilepsy or apoplexy, disease of the inner ear (Meniere's disease), or be consequent on diseased heart. It follows, therefore, that the cause of the symptom is to be discovered and the treatment appropriate to that condition adopted. The commonest causes are neurasthenia and dyspepsia, to which diseases the reader is referred: if the giddiness is severe and frequent it may arise from disease of the brain. It should never be ignored in the elderly. When the attack comes on the patient should lie down flat.

Goitre. *Disease of the Thyroid Gland.* Two varieties of goitre must briefly be noticed. These are: (1) *Simple goitre*;

with overgrowth (hypertrophy) of all the tissues constituting the gland. The enlargement may be uniform or greater on one side, confined to one of the lateral lobes or to the middle portion. The tumour is generally irregularly ovoid, elastic, and free from the pain present with tumours of foreign growth. As a rule the symptoms are those produced by pressure; but occasionally the growth may check the secretion of the gland and bring about a swollen condition of the limbs, face, etc., with mental weakness. This condition is known as myxœdema (see p. 208).

Another condition due to defect of the thyroid gland is *cretinism*. A cretin child is an idiot of a particular type: the children of goitrous mothers are sometimes cretins. Goitre is common in some parts of India, especially in or near the Himalayas. It is thought now that the enlargement of the thyroid gland is due to a micro-organism which reaches the subject through an infected water-supply and is also intimately related to an insufficiency of iodine in the food and water.

The gland lies on either side the middle line just above the breastbone. The two side lobes are joined across the trachea by the isthmus and the pyramidal lobe. It sometimes attains a great size, causing, by pressure on the windpipe and bloodvessels of the part, difficulty of breathing, difficulty of swallowing, headache, and change in the pitch of voice.

(2) Quite a different sort of disease is *exophthalmic goitre*, or 'Graves' disease,' in which prominence of the eyes is a very marked symptom, and the heart is liable to be affected. The enlargement of the thyroid may be general or partial. Sometimes there is slight pain, and the swelling is soft and pulsates. Considerable tremor of the hands is generally present, and the patient looks startled. This disease is apparently not conveyed by an infective organism as simple goitre is, but is more of the nature of a nerve disease, the feature of which is an excessive amount of thyroid secretion. The symptoms in this disease are serious, and the very opposite to such as may follow in rare cases of simple goitre. The myxœdema produced by diminished thyroid secretion is benefited by feeding with fresh thyroid glands, or from thyroid extract. 'Graves' disease' is aggravated by thyroid feeding, and often relieved by *removal* of portions of the gland. Pressure symptoms may be present in exophthalmic goitre as in simple goitre. In both they may be so serious as to require

surgical interference, either for tracheotomy to relieve difficulty in breathing, or removal of part, greater or less, *never all*, of the gland where breathing and swallowing are affected. In 'Graves' disease' the pulse and respiration are more rapid than normal. Exophthalmic goitre is much less common than the simple variety.

Treatment. Simple goitre, when small, should be treated with iodide of potassium internally, Prescription No. 56, and steadily for months, to give it a chance. An ointment of the iodide of mercury, Prescription No. 84 should be freely applied. Persons using the iodides in large doses, or for long periods, may find themselves attacked with *iodism*, a group of symptoms as follows: itching and swelling of the eyelids, nausea, pain in the parotid gland and *salivation*, nasal catarrh, occasionally purging, and an eruption of pimples on the face, neck, and upper part of the trunk. In a few cases *eczema* takes the place of this eruption. Some persons are very sensitive to iodine, but these are the exception; iodism except as catarrh and a mild eruption is rare. Should any appearance of myxœdema (see p. 208) take place, thyroid tablets will be of benefit. Only when a simple goitre is so large as to cause danger by pressure is an operation necessary or even desirable. The whole of the gland must never be removed. Benefit may sometimes be obtained by means of the X-rays: and sometimes by means of a vaccine.

Exophthalmic goitre is best treated by rest in bed in its severe stages, and by means of the X-rays. A doctor should be consulted at once, as the disease is serious. It is often advisable to operate and to remove part of the gland, never give iodides or iodine without medical advice.

Thyroid gland should never be taken without medical advice. There is a tendency to use this medicine freely in cases of obesity, but this should only be done with the advice of a doctor.

Gout. Gout is a general disease of the body showing itself usually in acute attacks of pain in one of the joints; but sometimes in less definite affections of other parts of the body. Gout is not due to uric acid, as has been thought, but its occurrence is connected in some way with an upset of the usual chemical changes that occur in the body during the assimilation of proteins, and uric acid and substances allied to it are often in excess at such times. A tendency to gout may be hereditary, or it may occur as the result of

prolonged excess in eating or drinking. The subjects of gout are usually the middle-aged, meat-eaters and non-abstainers, but gout may occur in a vegetarian Brahmin. It is however becoming increasingly rare.

An attack, or, as popularly termed, 'a fit of gout,' is usually preceded by irritability of temper, feverishness, headache, and symptoms indicating indigestion. Gout most frequently comes on during the night. There is acute grinding pain in the part, most usually the great toe, abating towards morning, but leaving the toe red and swollen, tender and shining. There is also acid perspiration; the patient's temper is increasingly irritable; and the urine, at first scanty, high-coloured, and clear, afterwards becomes more copious, and deposits a sediment resembling pounded brickdust. For several nights the pain may return, although it is usually lessened as the swelling increases. As the pain and swelling subside the skin of the part peels off in flakes. The disease then disappears, perhaps not returning for months. Repeated attacks may lead to ulcers and *chalk-stones*. Gout may occur in the fingers with similar results. The nails of gouty persons become hard, brittle, and marked with lines. In rarer cases it may suddenly leave the toe and attack the stomach, which will be known by sudden and excruciating pain at the pit of the stomach, with flatulence, faintness, nausea, and feeble irregular pulse. This is called 'suppressed' gout. Gout may also attack other internal organs, causing giddiness, bronchitis, asthma, and affections of the skin, eye, ear, heart, and brain. These latter manifestations are included in the term 'irregular gout.'

Treatment. On the approach of the attack, or fit, the bowels, if confined, should be moved by Prescription No. 27, and in the absence of colchicum, sulphate of soda should be given in 2-drachm doses three times a day. But the medicine must not be allowed to depress the patient, and should be reduced in quantity if it acts too much on the bowels. The local treatment consists in wrapping the inflamed part in cotton-wool, and then keeping the limb well raised from the ground, and as still as possible. In all cases warmth is the great thing, cold having a tendency to drive the gout to some internal organ. Hot fomentations may be applied. Rest must be absolute, and the diet must consist only of milk, arrowroot, barley-water and the like. Mineral waters and Imperial drink (Chapter XXI) may be given freely. Those liable to gout should obtain colchicum wine, and during an

acute attack take 20 minims of the wine in 2 ounces of water every four hours till the pain has abated. The wine should then be promptly stopped. Those with weak hearts should not take the colohicum at all, except under medical advice. Stimulants are best avoided by the gouty : if necessary, Scotch whisky is the best form in which to take the alcohol.

After the ' fit ' the diet should be mainly vegetable. Fish is better than flesh, and chicken than beef or mutton. Sweets and articles containing sugar must be altogether avoided. As a rule fermented liquors should not be taken. Regular exercise and attention to the bowels are also enjoined. Residence for a time at a spa is often of great benefit to the gouty : Harrogate, Buxton, and Bath are all to be recommended.

Gravel. Gravel signifies a deposit in the urine. There are two principal kinds, *viz.*, red and white gravel.

Red Gravel is composed of uric acid, or of other salts termed urates (the principal being urate of ammonia or soda) more or less mixed with the colouring-matter of the urine. Sometimes, from variation of the latter, such deposits are rather pink than red. The urine of persons passing red or pink gravel is clear, acid, of dark golden colour, and often less abundant than the urine of health. After it has cooled, the red or pink deposit appears as a sediment.

Sometimes these urates become deposited in the kidney to form a stone there, and it is the passage of such a stone down the ureter that causes renal colic (p. 175). If the stone reaches the bladder it may not leave that again, but remain there and, with additional concretions, grow larger to form a stone in the bladder (p. 354)

White or Yellowish Gravel consists chiefly of crystalline salts formed from the urine, the principal being oxalate of lime, phosphate of lime, or ammonio-magnesium phosphate of lime. The white or yellowish gravel is formed from the urine before it passes from the body, and the urine is therefore turbid when passed, and if heated does not become clear like urine containing urates. The oxalates occur in acid urine, the phosphates in alkaline urine.

The passage of red or pink gravel is connected with a variety of conditions. Tawny or reddish sediments arise from a common cold, and are frequently associated with heart-burn, acidity of the stomach, and other symptoms of indigestion or disordered liver consequent on too rich diet. The pinker varieties are generally associated with acute rheumatism

or gout, often following or alternating with attacks of the latter malady. Sometimes passing red gravel causes dull pain in the loins and repeated calls to make water, but frequently there are no symptoms. Large collections of gravel amount to a 'stone' either in the kidney or the bladder, and the symptoms that stone may give rise to should be consulted under those headings. The passage of oxalate of lime may give rise to pain in the loin and even the passage of blood in the urine. It is often associated with flatulence and occasionally diarrhoea.

Treatment. Except in so far as the passage of red gravel may be symptomatic of gout or one of the other diseases mentioned above, it does not require treatment. Neither, in fact, does the passage of white or yellow gravel, which is largely dietetic in origin. Many people become extremely anxious at the appearance of a cloudy urine, either turbid when they pass it or becoming so shortly after and giving a heavy white deposit. They think they must be losing valuable material, and some even imagine that the deposit is formed by semen. It is true that in neurasthenia the deposit of phosphates is liable to occur; but in any case the phenomenon is nothing to provoke anxiety. The appearance of the urine depends upon its acidity or alkalinity. When acid, as it normally is, the phosphates are dissolved; but after a meal the acid of the body is wanted for gastric juice, and then the urine is likely to be alkaline for a time, and phosphates deposited. A vegetarian diet will give more phosphatic deposit than an ordinary mixed diet. Certain dietetic restrictions may assist if the gravel is uric acid or oxalate of lime crystals. But as the diagnosis depends on the microscopical examination of the urine a doctor will have to be consulted.

No treatment is necessary as a rule, but the phosphates may often be made to disappear by taking Prescription No. 33 or No. 34 thrice daily after meals, and by taking plenty of exercise and less vegetables in the food.

Headache. Headache is not a disease itself, but a symptom of disease, and a very common symptom. A few individuals seem so fortunate as never to have a headache, on the other hand some women seem to be never without a headache of more or less severity. Most people are between these two extremes and are subject to occasional headaches, and the symptoms are so familiar as not to need description. To treat a headache it is above all necessary, as with other diseases to

discover its cause and remove that if possible. According to their causes we can class most headaches into one of the following groups :

(1) *Toxic*, that is to say due to poisonous matters circulating in the blood. Such harmful matters may either be eaten, drunk, or smoked, such as alcohol or tobacco ; or they may be made in the body, such as the toxins of the fevers which are made by micro-organisms. Another variety of toxic headache is that arising from dyspepsia or from constipation due in such cases to the absorption of harmful matters from the bowel. Sometimes in the malarious a headache will take the place of an attack of ague. A toxic headache is usually frontal, that is to say in the forehead : it is a common variety.

(2) Another very common variety of headache is the *Nervous*. Here again some help in the diagnosis of its cause may be obtained from noting the part of the head affected, which is usually the vertex.

A nervous headache may be due either to hysteria or to neurasthenia, to an account of which diseases the reader is referred. The typical hysterical headache is felt on the very top of the head, as of a nail being driven in. The commoner cause by far, however, is neurasthenia. Neurasthenia may cause an ache in almost any part of the head, including the feeling of a constricting band round the whole head. Of similar nature is the headache due to fatigue. A combination of two factors, the dyspeptic (toxic) and the nervous together often cause a headache. Of such nature is the headache of the busy man who hurries over his food, or remains at work too much without exercise, or drinks tea immoderately : or the headache of the equally busy pleasure-chaser who sits up late and perhaps drinks, eats, or smokes without discretion.

(3) A third common variety of headache is that due to *irritation* from other organs. The commonest variety of this is the eye headache, and this may be felt in the forehead or back of the head. Eye-strain, due to defective refractive powers of the eye, are common causes of headache in children, especially when they begin to go to school, and any such child should be taken early to a competent oculist (*not* to an optician) to have his vision tested. In adults the pain may be produced by close work, such as reading or sewing. Headache from irritation of the womb is usually felt either on the top or back of the head. Bad teeth also may cause headache,

usually either at the back of the head or on the temple. A nose headache may be caused by congestion of the mucous membrane in the nose and is felt at the top of the nose first: it is made worse by bending over or coughing. A similar sort of headache is that arising from catarrh of the frontal sinuses, which are in the forehead; such catarrh frequently accompanies an ordinary cold in the head or coryza and accounts for the headache so common on these occasions. Headaches associated with frontal sinus disease is characterised by the clockwork regularity of its onset and departure every day.

(4) Other causes of headaches may be classed as *brain diseases*, including therein abnormal conditions of the blood-vessels of the brain. Thus the brain may be underfed, owing to the poorness of the blood in anæmia; or there may be only temporary anæmia of the brain, due to disease of the arteries, which occurs in some diseases of the kidney: or the brain blood-vessels may be congested as in some diseases of the heart and lungs: or there may be actual disease of the brain matter itself or of its membranes. In all such instances the headache will usually be only one of many symptoms, and not the most striking one to the observer, though troublesome to the patient. In the early stages of disease of the kidneys and blood-vessels headache may however occur alone and is then of help in diagnosing the real condition.

The headaches associated with brain disease are apt to be very severe, so severe as to wake the patient out of sleep and to keep him awake.

The above description will account for most headaches; but it must be understood that the strict localisation to certain areas does not always hold good, as a nervous pain is inclined to spread and apparently involve other areas than that specifically affected. Moreover, as already explained, two causes may act together, or some outside cause may be the exciting factor in a subject already predisposed by other reasons. For instance a depressing atmospheric condition such as a thunderstorm may cause a headache in one already neurasthenic.

The *treatment* of headaches must be based on the diagnosis of their cause. The most direct in their indications are those arising from (3) irritation of other organs, where attention to eyes, teeth, nose, or elsewhere may cure permanently. The next clearest indication is in the class (1) of toxic headaches.

If the toxin be from without, such as tobacco or alcohol, the obvious treatment is to discontinue the supply.

In the headache of fevers, worst in enteric fever, only palliative measures can be adopted. The application of crushed ice to the forehead, or of some cooling evaporation lotion, such as eau-de-Cologne and water, will help to relieve the symptom. If severe, 10 to 15 grains of potassium bromide may be given in such cases. Where the cause is dyspepsia or constipation, and these are common causes of children's headaches, if the attack be not chronic but of brief duration, then abstention from food for a short period, combined also with one or two mercury powders. Prescription No 81, followed by a night's rest, with $\frac{1}{2}$ ounce of Prescription No. 27 next morning if necessary, is usually sufficient to procure a feeling of health once more. Of such nature are many of the so-called 'sick headaches'; others are of a neuralgic nature. But if the dyspepsia or constipation be chronic, then a longer course of treatment for these conditions must be undertaken.

The headaches of class (1) require treatment based on the conditions present. Anæmia should be treated if present (see p. 131); if there is congestion from heart or lung disease, a smart purge may relieve, but medical advice should be sought. Medical advice is also necessary in the treatment of headache due to kidney disease, as the drugs suitable for such may be harmful in other conditions.

In the treatment of (2) nervous headaches or of those where neurasthenia is a factor, much will depend upon the idiosyncrasy of the patient. Here again if the nerve fatigue is chronic, measures must be directed primarily to the general condition. The hard work, late nights, sources of worry and other deleterious causes mentioned above must be stopped, and a holiday will often be advisable. Personal hygiene must be attended to. If, however, the condition is temporary and acute, relief may be obtained by many of the antipyretic drugs commonly used and sold for the purpose. Phenacetin, 5 grains, combined with caffeine citrate, 3 grains, is a common remedy. Five to 10 grains of acetyl-salicylic acid, better known under its German name of aspirin, is preferred by many (and aspirin is especially likely to be useful in those headaches of rheumatic origin); or 5 grains of dimethyl-amino-antipyrine (German synonym, pyramidon) may be dissolved in a wine-glass of water and slowly sipped over the space of half an hour. These drugs will be found to act better if taken with a little warm

milk on an empty stomach, and followed by the patient's lying down in a dark room for at least half an hour. There are some cases of chronically recurring headache which are best controlled by regulation of diet, and such are those patients who are devotees of certain food cures, such as vegetarians and purin-free adherents. These cases are toxic in nature as already described, and many of them are benefited by such diet because by its adoption they eat less than they did formerly, when they were probably over-feeding. In every case then of chronic or frequently recurring headache search first of all for some local cause, such as an error of refraction or decayed teeth: it may be necessary to consult specialists on these subjects before the seat of mischief can be located.

Heart, Diseases of the. To distinguish the diseases of this organ requires a high degree of medical skill, accurate knowledge of the anatomy of the organ, a correct ear to judge of the sounds of the heart, and much practice. There are certain symptoms which are common in affections of the heart, but as these can mostly be mimicked by other conditions they should not be the cause of alarm, but are worthy of an overhaul by a physician.

Shortness of breath on exertion, which gets progressively worse, swelling of the feet and palpitations, are frequent in heart disease. Pain under the breast bone that passes down the left arm or up to the neck is characteristic of an anginal attack (*see angina*).

Pain over the heart is commoner in indigestion than it is in diseases of the heart, and an occasional intermittency of the pulse may have no harmful significance.

The significance of palpitation as a symptom is dealt with separately on p. 214. A short account of angina pectoris, which is an accompaniment of some forms of heart disease, is also given on p. 134. For an account of fatty heart read Obesity on p. 212. In the young, heart diseases are usually a sequence of rheumatic or some other acute fever (*see Rheumatic Fever* on p. 96). In the middle-aged, heart diseases are often the result of muscular strain, overwork, syphilis, or fevers. It would be out of place to give any further account here; a physician should be consulted when symptoms pointing to inefficient heart action arise.

Heartburn. This term is applied to a feeling of heat in the chest and throat, often accompanied by hot, or cold, acid cructation of watery matter. This malady has nothing

to do with the heart, but is a symptom of indigestion, and should be treated as dyspepsia (see p. 160). Ten grains of bicarbonate of soda in a little milk-and-water may be taken.

Heat, Effects of. There has been much confusion hitherto in the nomenclature and description of the different affections due to excessive external temperature whether caused by the direct rays of the sun or not. We may include all such conditions under the term *Effects of Heat*. The term *Sunstroke* should only be applied to an affection of sudden onset caused by the direct rays of the sun. Serious and even fatal symptoms may be caused by heat apart from the sun's action, as for instance by work in the stokehold of a ship. The direct rays of the sun may cause irritation of the membranes round the brain, and the symptoms of this condition may differ somewhat from those caused by a high external temperature generally; but the two conditions and the two causes are so often associated and the treatment is the same, whether the cause is the sun or not, that they may well be described together.

Mild forms of the effects of heat are sometimes called Heat Exhaustion and Heat Prostration; the more serious affection is called Heat Stroke.

Heat Exhaustion may overtake a person working in the sun or in any high temperature: it is a form of syncope or fainting. *Heat Prostration* sometimes called *Heat Syncope* is a more severe form of the same thing. Heat syncope begins with feelings of faintness, sickness, giddiness, shivering, cold extremities, frequent desire to make water, and sometimes drowsiness. The face is pale, the surface of the body is cold, and often bathed in perspiration. The breathing is of a sighing or gasping character, the action of the heart and pulse is weak, sometimes intermittent, the pupils of the eyes are dilated, and there may be more or less insensibility. The temperature is often subnormal. Frequently there is no such beginning of which the patient is conscious, but he falls insensible with the above signs. If he recovers, as this type usually does, there is a tendency to reaction, and the temperature may rise high above the normal.

Treatment. When the patient is faint, sick, giddy, shivering, and cold, lay him on his back in the shade, rub the limbs and loosen the clothing. It is best not to give stimulants, because of the tendency of a reaction later to high temperature. But if the rectal temperature is below 97° F. the patient

may well be put in a hot bath (Chapter XX), if available, to rally him ; removing him as soon as the rectal temperature shall reach the normal.

Heat Stroke, when not due to the direct rays of the sun, is sometimes preceded by certain premonitory symptoms. For instance, the person affected becomes irritable, restless, and complains of headache. He feels dull and listless, and is unable to make much exertion without a great effort. The appetite fails, and a feeling of nausea with constipation is often present. An absence of perspiration may also be noticed the skin may be unusually hot and dry, there may be slight sensation of giddiness, and there may be frequent desire to make water, although little fluid is passed. Such premonitory symptoms may prevail for hours or for days previous to the fully developed attack, or they may not occur ; or, occurring, may pass away. When anything of the kind is noticed in persons exposed to a high temperature, every means possible should be used to secure ventilation and movement of air, shade and coolness should be sought, cold water should be plentifully drunk, and the body should be well sponged with water, or a bath should be taken. A purgative, Prescription No. 27, 1 ounce, or 2 ounces of Prescription No. 60, will generally be desirable. If, however, heat stroke ensues and, when due to the direct rays of the sun, it usually comes on without any such warning as above, then there is flushing of the face, heat of body and head, bloodshot eyes, strong quick pulse, stertorous snoring, or puffing breathing, or noisy, irregular, and incomplete breathing. In a very short period insensibility ensues, and sometimes convulsions. The temperature will be found very high, perhaps over 110° F.

Treatment. The patient is to be taken into the shade, or, if one is at hand, into as cool a room as possible. A bathroom may be the best place because of the water available. No stimulants are to be given. The temperature of the patient must be reduced as quickly as possible. The cold bath (p. 581), or cold sponging by the second method described (p. 572), may be adopted. But when the temperature is very high it is advisable not to place a mackintosh on the bed ; but to have the patient naked either on a string *charpoy*, or lying on a *chick* or Japanese reed mat laid over a wire-mattress bed. This will allow free access of air to all parts of the body. A stream of cold water is allowed to play on the patient's head from a distance of about 18 inches. This stream

should not be continued for more than a minute or so, when an ice-cap, or the coils (see Chapter XX), may be placed on the head instead. The rectal temperature should be taken every fifteen minutes, and cold applications stopped when the thermometer registers 102°F. A hot-water bottle to the feet will help to guard against collapse, even when cold is being applied to the rest of the body. All the time the punkah should be allowed to play vigorously over the patient's body. When breathing is laboured and the lips blue, benefit may be obtained by bleeding the patient about 10 ounces.

In some cases of high fever occurring during the hot weather, malaria is the cause, and an attack of ague may give rise to a hyperpyrexia like that of heat stroke. Sometimes, also the two causes, excessive heat and the malarial parasite may act together. If there is any likelihood of the patient having malaria, he should at once be given 30 grains of quinine by the mouth. If intramuscular or intravenous injections of quinine are available, they are still more efficacious. But these methods can only be employed by a doctor, who might also think fit to give an intravenous saline injection or to remove cerebro-spinal fluid by lumbar puncture, methods which are of avail in some cases. When the temperature has been reduced, 5 grains of calomel should be administered to the patient.

Although recovery from heat stroke is often rapid, more commonly fever and oppressed breathing prevail more or less for some days. All forms of heat stroke are frequently followed by periodical headaches, by fever, by neuralgic affections, by dysentery, and sometimes by paralysis. They occasionally leave permanent injury of the brain, which may terminate in softening of that organ, or in insanity. Often, when recovery seems complete, the person is unable to bear any exposure to the sun, and is unfitted for active life in the tropics.

Much may be done in the *Prevention of Heat Stroke*. As a rule the people who get heat stroke are not in the best bodily health. The liability to heat stroke is increased by fatigue, mental excitement, depression of spirits, unduly heavy clothing, living and sleeping in crowded apartments, lack of ventilation, want of water, especially constipation, and the abuse of alcoholic drinks.

One or all of these causes may be seen operating in a body of troops who are about to disembark or to tranship from one

vessel to another. The men have often been suffering from constipation on board ship and are perhaps paraded unduly early for a disembarkation that actually takes place an hour or so later than was anticipated. Amongst such a body of men standing about, and all more or less excited at the prospect of their new surroundings, heat stroke is especially liable to occur. Similar causes may operate in civil life. In the hot weather care should be taken to lead a regular life with early hours for bed and rising, to avoid an undue amount of alcoholic stimulant, to ensure a regular action of the bowels, and to wear loose clothing with glare glasses when necessary. Water should be drunk freely before any prolonged exertion that has to be undertaken. The person who gets heat stroke is one who has not been perspiring freely.

A mild form of *Sun Fever* may result from the direct rays of the sun, often not coming on till hours after the exposure. Of such nature are the cases where people attribute their headache or feverishness to a 'touch of the sun.' It is a common affection in children who have been playing in the sun, and the fever may not be evident till the evening or till the next day. The symptoms of severe cases indicate congestion of the membrane of the brain, and of some cases even meningitis. Many people who are exposed to the sun during the day experience some feverishness afterwards, and often take no notice of it. It may disappear in a few hours, or it may cause a restless night, and perhaps diarrhoea. Or it may continue with languor, weakness, loss of appetite, etc., the symptoms that commonly accompany any fever.

Treatment. For a minor degree of sun fever, or for irritability after exposure, a cold or tepid bath according to habit, rest and quiet under a punkah, and, if the bowels are confined, an aperient dose, are desirable. The more severe cases should be treated like those of heat stroke above described. On recovery from a severe attack leave to a cold climate or to the hills is advisable; and if headache is persistent, a course of potassium iodide and bromide should be taken under medical advice.

Hiccough. Consists of sudden, short, convulsive, spasmodic inspirations, attended by a peculiar sound produced in the larynx or upper part of the windpipe, spasmodic closure of the glottis, immediately followed by expiration. These convulsive inspirations often occur in paroxysms, succeeding each other at intervals of a few seconds. The paroxysm may

last only a few minutes, or may extend to hours or days. Hiccough, in most instances arises from indigestion, or from food too hastily swallowed. But it is sometimes present, as a symptom, during the progress of diseases of the liver and stomach, or of any other abdominal organ, and sometimes during influenza, lung diseases and brain infections. When depending on indigestion it may be generally relieved by taking a few grains of bicarbonate of soda and ginger, or by a little water. Sometimes in the case of indigestible food lodged in the stomach vomiting is required to produce relief, and a mustard emetic may be given. Spirits of camphor, chlorodyne, and sal volatile are also good remedies. Swallowing a piece of ice will sometimes give relief. When the attack is slight it may often be stopped by making a very full inspiration, and then holding the breath as long as possible. Strong pressure, with a belt tightly drawn round the body, over a pad on the pit of the stomach, will sometimes stop hiccough. Or pressing firmly near the end of the collar-bones next the throat with the thumb may be successful.

Hydrophobia. The saliva from the mouth of a rabid animal, dog, jackal, wolf, or cat, contains the poisonous agent causing this disease. A very slight wound, either from the teeth or claws, if saliva be on the latter, is sufficient to introduce the poison into the system. Following a bite from a mad dog hydrophobia may come on after some weeks, or months; but the usual *incubation* period is about six weeks. It does not follow that every one bitten by a mad dog must suffer from hydrophobia. The saliva may be wiped off by clothing, through which the animal's fang passes; or the person may escape without any assignable reason.

Symptoms. In most cases there is slight irritation at, or near, the scar of the wound, and there may be vague feelings, of uneasiness, melancholy, gloom, with irritability of temper, frightful dreams, or shivering. Sometimes there is twitching of the muscles of the face also, in many cases, fear and dismay lest hydrophobia should occur. After a few hours or days the patient complains of stiffness of the neck and difficulty of breathing, which suddenly pass into suffocative spasm most probably on some occasion when the patient attempts to drink. These spasms recur at variable intervals of minutes or hours, and eventually extend from the throat and chest to the muscles of the whole body, which are convulsed. The face is turgid, the eyeballs protruding, the patient foams

at the mouth, and claws at the throat as if to remove some obstruction. These general spasmodic seizures are succeeded by intervals of ease and relaxation. Between the spasms saliva which cannot be swallowed collects about the mouth, causing perpetual 'hawking' and spitting. At first these spasmodic attacks are excited only by attempts to swallow fluid; later the sound or sight of fluids, suggestions to swallow anything, movements or looks of bystanders, draughts of air, rays of light, the sight of anything white, or of a dog, may excite spasms. There is generally some rise of body temperature. As the throat spasm spreads to wide convulsions, so the mental distress may proceed to frenzy, causing the patient to rush wildly about, in a state of maniacal fury. It is popularly supposed that the patient barks like a dog, for which the 'hawking' has been mistaken; and that he tries to bite his attendants, for which the spasmodic movements of the jaws have been mistaken. The ordinary duration of hydrophobia is from one to four days, after which the person dies exhausted, or suffocated from spasm of the throat. Hydrophobia may be mistaken for tetanus, and the distinctions are given under the latter disease.

There is an affection, arising from nervous influence, or fear, after an injury by an animal which is *not* mad. This is called *spurious* or *false hydrophobia*, but the symptoms are very similar to those of the real disease. Instances of reputed recovery from hydrophobia are usually from this false form of the malady, which may be regarded as present when it can be proved that the sufferer has *not* been injured by a rabid animal.

Treatment. Once hydrophobia develops death is certain to follow. All our efforts therefore should be devoted to the prevention of its onset in cases of bites from rabid animals. It is essential for this purpose to go at once to one of the Pasteur Institutes established by Government at Kasauli and Coonoor and in Burmah. The measures that should be adopted are here given in full as recommended by the Pasteur Institute at Kasauli.

I. MEASURES TO BE ADOPTED IN THE CASE OF AN ANIMAL BITTEN BY A RABID ANIMAL AND MATTER RELATING TO RABIES IN ANIMALS

The biting animal should on no account be destroyed unless dangerous to human beings. Much more satisfactory evidence of rabies is got from observing the suspected animal

than by killing it and sending its brain for examination. Moreover, the brain is often found to be useless for test on its arrival. In any case a negative result of the test does not allow the inference that the animal was not rabid. The animal therefore should be carefully chained up and observed for ten days. If it remained alive and well for ten days after the date of the bite, then rabies may be excluded altogether and consequently anti-rabic treatment becomes unnecessary.

The case of the animal bitten must be distinguished from that of the biting animal. If the former is not very valuable it had better be destroyed at once and so prevented from causing any danger to human beings or other animals. If it is valuable or, for any other reason the owner refuses to have it destroyed, it should receive a course of prophylactic injections without delay. These courses which are obtainable from the Pasteur Institute, Kasauli, differ in amount according to the species and size of the animal to be treated. In ordering a course, therefore, the species of animal to be treated should be mentioned and, if a small animal, its approximate weight. The incubation period of rabies, i.e., the period subsequent to a bite, during which no symptoms show themselves, varies from about ten days as a minimum to several months as a maximum. If, then, the owner decides to keep the bitten animal it should be securely tied up and must be kept under strict restraint for at least three months from the date of being bitten. If taken for exercise it should only be on a stout chain and securely muzzled.

Rabies occurs in two forms, known respectively as furious rabies and dumb rabies. Some of the symptoms and signs of developing rabies are those of brain irritation, some are those of paralysis. A rabid animal may show: (1) Skulking and changed demeanour or a tendency to snap, bite, or attack unprovoked other animals or human beings. It may at the same time exhibit signs of affection towards and no inclination to bite its own master. (2) Tendency to stray from home. (3) Perversion of appetite. (4) Paralysis of the lower jaw. Paralysis or weakening of the extremities. (5) Escape of frothy or ropy saliva from the mouth. (6) Altered character of the bark. (7) Proneness to attack savagely a stick or other object held out towards it. Biting at imaginary objects. Tearing up ground in its neighbourhood.

Fear of water is not a symptom in animals; inability to eat or to lap fluids may not appear till very late in the disease.

In dumb rabies the symptoms are similar except that all symptoms of fury are absent.

II. MEASURES TO BE TAKEN BY A PERSON BITTEN BY A RABID OR SUPPOSEDLY RABID ANIMAL

The wound made by the bite should be washed, dried, and then thoroughly cauterised with pure carbolic acid, permanganate of potash crystals, silver nitrate or other caustic.

There are two methods of diagnosing rabies from an examination of the brain, namely the inoculation method and the microscopical method. Both of these methods require that a portion of the brain be sent to a laboratory, and consequently the skull of the animal must be opened.

Don a pair of old leather gloves. Take a hammer and, with a few hard sharp blows, fracture into pieces through the intact skin the top and sides of the brain cavity. With a knife throw back the skin and then remove, as carefully as possible, the pieces of fractured bone, in this way exposing the brain. For the inoculation method remove with a clean knife a small piece of brain about the size of a walnut and place it in a small bottle of pure glycerine. The bottle should be filled to the top with the glycerine. On no account is an antiseptic to be allowed to come in contact with the piece of brain nor is anything to be added to the glycerine. For the microscopical method a special portion of the brain is desirable, namely the *Hippocampus major*. As this is somewhat difficult to dissect out by anyone unaccustomed to such work, it is best to remove the brain entire. It should be at once wrapped in wool or tow and put into a wide-mouthed bottle filled to the top with the following solution :

Zenker's fluid	{	Potassium bichromate	. 5 drachms.
		Mercuric perchloride	. 7 drachms.
		Glacial acetic acid	. 7 drachms.
		Water	. . . up to 20 ounces.

If glacial acetic acid is not available, ordinary acetic acid (21 drachms) will serve the purpose.

If the brain is a large one, one-half of it only need be sent, as there is a *Hippocampus major* on each side ; for this purpose it should be divided exactly down the centre. The brain or half brain should be wrapped in tow or wool. The bottle should be filled to the top with fluid and plenty of fluid used. If the above solution is not available country spirit or methylated spirit or 10 per cent. formalin will allow of a fairly good

microscopical examination. It is important that the brain of the biting animal should be so sent that both inoculation and microscopic tests can be done. In removing the brain of a rabid animal, the greatest care must be taken not to allow the saliva or brain substance, both of which, as we have seen, contain the rabies virus, to come in contact with any cuts or abrasions on the hands or indeed with the hands at all. Both the bottles should now be carefully and firmly packed with sawdust or cotton-wool in a box and dispatched to the institute to which the person bitten has been sent.

The experimental method takes from two to six weeks to obtain any result, while the microscopical method can be carried out in a day or two ; but a negative result in either instance is, for various reasons, not proof positive that the animal was not mad.

If the animal is under observation and appears quite healthy, the person bitten may with safety wait until it is settled from the observation of symptoms whether the animal is rabid or not. In the case of severe bites, however, or of bites on the head, face or neck, it is safer to commence treatment without delay. The treatment may be discontinued if the animal remains in perfect health for ten days after inflicting the bite. In cases of doubtful infection it is better to send a detailed telegram of the facts to the Director, Pasteur Institute, for an opinion than to send a man off immediately on what may be a useless and expensive journey. The course of treatment lasts from seven to fourteen days.

Hypochondriasis. This is a condition which is purely psychological. The rational of the disease is that a patient is fearful and anxious about something of which he is not conscious, something which remains in the unconscious part of his mind. He fixes this anxiety on some bodily organ, or on some ideas connected with disease and in his conscious mind he only recognises these to be the cause of his anxiety. The root of the anxiety and fear may be sexual or a failure to adjust himself to life, or some forgotten event of which he was ashamed, or some childish fear or experience in childhood. For the elucidation and cure of this condition, expert psychological treatment is necessary as no amount of ordinary persuasion will convince him of his error.

These cases though sometimes ridiculous are to be taken seriously, as the condition may pass on to more serious mental disease. In mild cases the following measures may help the

patient. A change of habits and environment should be tried ; in severe cases leave home should be applied for.

In cases of home sickness associated with hypochondriasis the condition is usually hysterical. Illness being sought as a solution of the problems of the patient's environment.

The life of the patient should be organised into a routine, and any error in diet or habits corrected.

Hysteria. The hysterical symptom is an attempted solution of some difficulty by the unconscious part of the mind. This difficulty should be sought for by a competent psychologist, who will be able to suggest some better solution to the conscious mind. There is probably an underlying tendency to hysteria—the hysterical temperament being one that is marked by an unnatural craving for sympathy. It is much commoner in women ; but does occur amongst men, both European and Indian, it may also occur in children. Hysteria may manifest itself in one of two ways, either by some disturbance of function and train of nervous symptoms or by convulsive fits. The principal nervous symptoms are : Flatulence, flushings, hiccough, palpitations, choking sensations, and loss of voice. Pain in various parts of the body, loss of all sensation in parts of the body, or paralysis of one or more limbs. Nearly every ailment may be simulated by hysteria, and the patient will plaintively detail symptoms very similar to those of real disease. Thus it may be supposed that an hysterical woman is suffering from inflammation of the bowels, or of the womb, or of the throat, when there is nothing of the kind the matter. Stiffness, or even paralysis of a joint, affections of the spine, retention of urine, stricture of the gullet, may all be hysterical manifestations.

The reader must not regard the hysterical patient as a malingerer. Although too much sympathy should not be shown, yet the disorder really exists in the mind of the patient, and the pains are actually felt. In some cases, however, the hysterical patient goes so far as to make disease, apparently for the purpose of creating that sympathy for which she has a morbid craving, and she may then stick pins or needles into the flesh, or swallow them. She will sometimes refuse food, but will obtain it surreptitiously ; or she will secrete and swallow blood or other fluid, so that she may afterwards vomit it up, as if from disease. Frequently, in cases of hysteria, the monthly functions are irregular.

When convulsive hysterical fits occur, they are usually

characteristic. The patient, usually a young girl, in consequence of mental excitement, suddenly loses command of her feelings and actions. She subsides on a couch or in some comfortable position, throws herself about grinding her teeth, clenching her fists, shaking her hair loose; she clutches at anyone or anything near her, kicks, cries and laughs alternately. The eyeballs may be turned upwards and the eyelids opened and shut rapidly. At times froth appears at the lips, and other irregular symptoms may develop.

Sometimes such attacks are difficult to distinguish from epileptic fits. The distinctive features are given on p. 171 under Epilepsy. Hysteria should not be confused with neurasthenia (see p. 209).

Treatment. During the paroxysm the dress should be loosened, plenty of fresh air should be allowed, a fan should be used, and cold water, vinegar, or eau-de-Cologne may be sprinkled on the face, smelling-salts, or the smoke from burnt feathers applied to the nostrils, and the extremities should be well rubbed. There is no remedy like a bucket of cold water. Throw the water quickly over the head and chest: it acts 'like a charm.' Hysterical persons should not, however, be treated roughly; for it does not follow that because a person is hysterical she may not have some other disease. On the other hand, *sympathy is misplaced*, and will usually make an hysterical person worse. Although hysterical patients cannot altogether avoid their attacks, they can, to a certain extent, guard themselves against the seizures; and this, they should be made to understand, they are expected to do. In the intervals between the fits, good food, good air, exercise, employment for the mind, attention to the bowels, and cold bathing are necessary. If the monthly flow is deficient or irregular, attention must be directed to this condition.

The treatment of hysteria apart from the fits should be more mental than medicinal. Drugs are not much required. Any physical cause of ill-health or depression should be removed and the patient placed under the care of a firm but kind friend in quiet surroundings. As mentioned above the assistance of a competent psychologist may produce considerable improvement in the condition.

Insomnia. Insomnia or sleeplessness is a symptom that may arise from various causes, of which the commonest in India is neurasthenia (see p. 209). But in the absence of neurasthenia or of anæmia from any cause, sleeplessness may

arise from dyspepsia, mental anxiety or excitement, late meals, alcohol, tobacco, or strong tea or coffee at night, want of exercise, close, unventilated rooms, too soft or too hard beds, from cold feet, and, in India, from heat, and mosquitoes. Every case must therefore be treated on its own merits. The dyspeptic should not go to bed with an undigested meal in the stomach, and should avoid alcohol, tobacco, tea, and coffee at night. Regular hours of retiring should be adopted, so that the force of habit may be enlisted. Exercise is necessary, and should be taken to the verge of fatigue. The work of the day should be dismissed from the mind, and any excitement, such as reading works of fiction at night, should be avoided. Intervals of relaxation must be insisted upon, and in bad case entire mental rest. When the tone of the system is lowered, as in neurasthenia, a moderate supper of plainly cooked and nutritious food frequently predisposes to sleep. In other cases a glass of water taken before retiring does good, and a night-cap in the form of stimulants is often of benefit, in those accustomed to it, while for others a cup of hot milk or ovaltine at bed time may be found of assistance. In all instances the bedroom should be well ventilated, the window open, the bed in the middle of the room, or else have the bed on the veranda or out of doors entirely. When the patient is neurasthenic, the treatment laid down for that condition (p. 209) must be adopted. In the case of the European long leave home will often be necessary to deal adequately with insomnia. For old people, or those with weak circulation, a hot bottle to cold feet is desirable. It must be remembered that after the age of 50, 5 to 6 hours sleep is often sufficient, otherwise in adolescents and adults $7\frac{1}{2}$ to 8 hours should be aimed at. Bromide of potassium, Prescription No. 55, may be taken, two hours before the sleep is desired—a medicine especially useful in cases of sleepiness by day and wakefulness at night. But, as far as possible, it is best to avoid drugs. Sometimes motoring, or a warm bath at bedtime, produces the necessary amount of sleepiness. The hot weather is a potent cause of sleeplessness in India. The minimum of clothing should be worn at night, and provided a bath towel is wrapped round the abdomen there need be no fear of a chill, even if a ceiling fan or punkah is used. Late hours and heavy dinners should also be avoided in the hot weather in the plains.

Jaundice. In this disease the skin becomes yellow, which

has led to the malady being spoken of as *yellow jaundice*. The two main classes are: Jaundice, due to some obstruction, mechanical or caused by disease, which prevents the *outflow* of bile from the liver; or to an obstruction, generally due to disease, which prevents the flow of bile in the liver. In either class the excess is absorbed by the blood. The whites of the eyes assume a greenish or yellow tint; the bowels are confined, the fæces are white, or clay-coloured, but the urine is of a deep yellow; the skin generally itches, and there is a bitter taste in the mouth, coated tongue, and nausea, especially in the morning. The cause of all these appearances is bile in the blood. Other symptoms that commonly accompany jaundice are a slow pulse, undue tendency to bleeding, and great depression of spirits and irritability.

Jaundice may be *temporary* or *permanent*.

Temporary jaundice may be the result of congestion of the liver (*see* p. 203). Or it may arise from a gall-stone in the bile-duct preventing the passage of bile (*see* p. 174). It also occurs during certain kinds of fevers. But usually, temporary jaundice is the result of a catarrh in the small bile-ducts. This catarrh often is accompanied by catarrh of the stomach. For jaundice of this nature, known as *catarrhal jaundice*, from 3 to 5 grains of calomel should be taken at once, and 1 ounce of Prescription No. 60 thrice daily. The food should consist of skimmed milk (*see* p. 609), Horlick's milk, orange juice, sweetened with Glucose and made into a drink, and clear soups; no alcohol should be taken. This diet should be persisted in until the stools become brown in colour and the urine loses its dark tint. If there is any rise of temperature the patient must be in bed. In addition to this 10 grains of hexamine should be taken twice daily for a week; and hot fomentations or poultices (*see* p. 576) applied over the liver. It is essential that the bowels be freely open.

This common form of jaundice, though generally mild in its nature, is often debilitating and sometimes very depressing mentally to the patient. Sometimes the colour takes several weeks to leave the skin and the eyes. The sufferer will be benefited by a holiday of a month or two after such an attack.

Rarely severe mental symptoms occur in the course of jaundice; the outlook then is bad.

Permanent jaundice depends on some serious or organic disease of the liver or other internal organ.

Kidney, Diseases of the. The kidneys are subject to

inflammation and to certain other diseases. Of the other diseases stone in the kidney is described on p. 353, while accounts of gravel and of other urinary conditions are given on pp. 175 and 180 respectively. Besides this the kidney may be infected by tuberculosis (see p. 236), by tumour, or by other conditions unnecessary to mention here.

Inflammation of the kidneys or *nephritis* is sometimes called after the name of the physician who described it, *Bright's disease*. The inflammation may be *acute* or *chronic*.

Acute Nephritis. The principal causes of acute nephritis are septic tonsils, septic skin conditions, or the toxins of some of the fevers, especially scarlet fever, diphtheria and small-pox. Exposure to cold and damp may precipitate the attack. And sometimes in pregnancy nephritis occurs without evident cause. The symptoms are slight dropsy (see p. 158), especially about the face, and pain in the loins, the pain being on both sides if, as usually is the case, both kidneys are affected. The pain strikes downwards towards the groin, and is of a dull, diffused, deep-seated character, increased by firm pressure, by coughing, or sneezing. It is also increased by straightening the leg on the affected side, and the patient sometimes lies on his back with his legs drawn up. Headache is a frequent complaint. Pain however may be slight or absent and the urine is scanty, and voided painfully, at short intervals; it frequently contains albumen, and often becomes dark from the presence of blood. There is usually considerable feverishness, and the bowels are mostly confined.

Acute nephritis has to be diagnosed from lumbago (see p. 207). There may be no dropsy at all. The course of this disease is variable; sometimes it is brief with complete recovery; too often it is long and leaves a permanent weakness of the kidney establishing the condition known as chronic Bright's disease.

Treatment. It is of considerable importance to have the advice of a medical man in the treatment of this condition. If this cannot be obtained, the patient should be put to bed and guarded against chill; he should be clad in flannels and put between blankets, provided the weather is not very hot. Fluids should be restricted to a maximum of 2 pints a day in adults but in children $1\frac{1}{2}$ pints should be sufficient. For the first 48 hours the fluid should consist of glucose, fruit juice and water. The bowels should be well opened with a saline purge. Prescription 27 is suitable and should be given in

sufficient quantity to produce two loose motions in the 24 hours. The loins should be fomented with hot turpentine stupes and cupping (p. 588) may be practised.

As the urine increases in quantity and improves in colour which it generally does after 48 hours the diet can be slowly increased by adding bread and butter, biscuits and half a pint of milk and after a further day, milk one or two pints. Bread, butter, biscuits, jam, milk pudding may be given. After 10 days steamed fish and chicken, vegetables may be given in the diet if the condition of the patient is satisfactory.

Chronic Nephritis. Chronic Bright's disease exists in several forms. One form follows the acute nephritis just described. Another, though apparently due to the same causes as acute nephritis, starts insidiously instead of with a sudden onset. Another form is due, as a rule, to degeneration of the arteries, both those of the body generally and those of the kidney especially, and this form is seen in the strenuous worker, the gouty, the syphilitic, or alcoholic; and sometimes is due to lead poisoning. Whatever form presents, certain changes in the structure of the kidneys occur which lead to a number of different symptoms. The most prominent early sign is the occurrence in the urine of a substance called albumen. But the fact of albumen, being found in the urine is *not* always demonstrative of Bright's disease. Albumen occurs in the urine of some persons after a cold bath or after certain articles of diet. Albumen not infrequently occurs during, or after, an attack of any fever. In some persons it occurs after any great muscular exertion. In most of these instances there is little or no actual disease of the kidney. If, in addition to albumen, casts of the tubes which secrete the urine and which form part of the structure of the kidney are found in the urine, it is evidence of kidney disease. But to discover these casts the urine must be examined with a microscope. In addition to albumen in urine, the early symptoms of Bright's disease are: Diminution in the amount of urine passed, having to rise several times in the night to make water, a dull uneasiness in the lower part of the back, indigestion and debility without any evident cause. When such symptoms occur and albumen is also found permanently in the urine, there is grave cause for uneasiness. But often Bright's disease comes on so gradually and imperceptibly that it is only discovered by the condition of the urine. As

the disease progresses it is further marked by increasing debility with headache, drowsiness, pallor, puffiness about the eyes, shortness of breath, frequent disposition to make water, especially at night, dyspeptic symptoms, and sometimes nausea, or even vomiting. At a later stage the heart usually becomes implicated and dropsy almost always occurs (see p. 158). There is also a great tendency in those suffering from Bright's disease to bronchial affections, convulsions, epileptiform, and apoplectic attacks. In some form of chronic nephritis severe dropsy is a feature throughout, even before the heart becomes involved.

Treatment. The various forms of chronic nephritis require considerable skill in their diagnosis and treatment. Forms that have scanty urine and dropsy and somewhat resemble acute nephritis should be treated on the lines of that disease. That is to say, the bowels should be kept freely open, the diet should be liquid, and the skin made to act freely by means of vapour baths and the other means above described. As these patients are invariably anæmic Prescription No. 51 may be given thrice daily with benefit. The most important thing in the treatment of these cases is to get them to reside in a warm and equable climate, such as that of Bengal, Bombay, or Madras. It is the cold season of Upper India that we find so bad for these cases.

In the other varieties of chronic Bright's disease, it is still more difficult to lay down rules for treatment, because the indications will differ with the needs of each case. Often the disease is latent, and treatment is sought for some trifling symptom apparently unconnected with the kidneys. The urine is usually freely secreted; where it is not, Prescription No. 46 may be given thrice daily with benefit. When dropsy occurs or there are signs of heart implication, the need is pressing. A medical man must be called in now; as indeed he should be at the beginning.

Some special features in the nursing of cases of kidney disease are given in Chapter XIX.

Leprosy. Leprosy is a chronic disease due to infection by a special bacillus

This bacillus may take up its situation more in the skin or in the nerves, or in both, and according to this selection the appearance of the patient will vary. When the skin is more affected there will be much thickening of eyebrows, nose, ears, and other parts, especially of the face, which may give

the patient the characteristic 'leonine' expression. When the nerves are more affected one or both hands are liable to become withered and claw-like. Also certain areas of skin may lose their normal pigment or become discoloured. Such areas are likely to be insensitive to the sensations of pain and touch, and especially to those of heat and cold. Often the first appearance of a leper before the doctor is for treatment of a burn that he has suffered through not feeling that something very hot was touching him.

The discoloured patches on a leper's skin are often popularly confused with the dead-white marks of *Loucoderma* (see p. 385) which is quite a different disease. A leper is never 'as white as snow.' Most lepers are of the 'mixed' variety of the disease, showing both skin and nerve lesions. As the disease progresses the trophic changes in the nerves of the extremities become more marked, and the ends of fingers or toes may drop off, or part of the substance of the digits become absorbed. Leprous lesions in the eye sometimes render the unfortunate blind.

Even if leprosy be entirely untreated the disease in course of time loses its virulence and its infectivity and may leave the patient a physical wreck, with loss perhaps of fingers and toes and disfigurement and crippling, but not at this stage infectious to others. Such a case is said to be "burnt-out" and most of the leprous beggars one sees by the roadside are in this condition. The early case of leprosy and often also the dangerously infective case may be quite unrecognisable as such by a non-medical person, who may think he is seeing a perfectly healthy man. That is the important point about leprosy, that it requires a skilled observer to recognise it in the early stages when it is most amenable to treatment. Europeans rarely become infected with leprosy in India, because they are of cleanly habits; but all the same if one lives in a part where leprosy is common it is well to have one's servants examined on engagement by a doctor to make sure they are healthy, especially a servant who has a discoloured patch of skin.

Much can be done in the *treatment* of leprosy and the disease is not the hopeless affair it is popularly supposed to be. It is important that the patient should be in good hygienic surroundings and well cared for. Good food is an important factor and there are various forms of specific treatment by injection which are of great benefit. The sufferer should be

placed under capable medical charge as soon as possible, preferably at one of the many leprosy clinics, several of which are established in India. The treatment usually lasts for years, but if the patient has been obtained early the outlook is hopeful. Those who treat leprosy do not speak of a patient being 'cured', because sometimes after long interval there is recrudescence of the disease: so they feel themselves on more scientific ground if they say a patient has become 'symptom free' or that the disease is "arrested", and there are very many lepers who reach that happy stage in whom the disease does not recur.

Liver, Diseases of the. The liver is the largest gland in the body and, for the reasons given herein, is especially subject to disease in the tropics. The following are the commonest affections of the liver, though it should be remembered that the liver, like other organs, is subject also to tumours and to other disease. Other affections of the liver have already been described under Gall-stones and Jaundice, to which reference should be made.

Liver, Congestion of the. Congestion of the liver may be active or passive; that is to say, there may be an active dilatation of the liver vessels which allows more blood to circulate in that organ, or the blood may be dammed back into the liver by reason of mechanical obstruction to the onflow of the blood from the liver to the heart.

Passive congestion is found as a result of heart and lung diseases. The liver may be so much enlarged and so tender in these cases as to lead one to think that organ itself is diseased, when really the trouble is due to the heart or the lungs. Such passive congestion should be treated by attention to the cause, usually the heart. Rest in bed on a light diet, combined with 1 drachm of jalap powder, or 3 grains of mercury pill at night, followed by 1 ounce of Prescription No. 27 in the morning, will benefit. Hot fomentations over the liver will also relieve this symptom; but the condition is one demanding the attention of a qualified physician.

Active congestion or hyperæmia of the liver is a condition especially common in warm countries and one that demands attention, because if neglected it may lead to actual inflammation of the organ. The causes of this frequency in the tropics lie partly in the feeding and partly in the liability to chills. Scanty clothing, especially on a hot night, may expose the surface of the organ, active after a meal, to a cold current

of air from wind or punkah. While a sedentary life, excessive eating, especially of rich and spiced foods, and drinking, especially of alcoholic liquors, are causes that bring more blood to the liver.

The *symptoms* of hepatic congestion are: Coated tongue, a bad taste in the mouth, depression of spirits, defective appetite, headache, bowels acting irregularly, occasionally bilious diarrhoea, but often constipation, nausea, a sense of weight and fulness in the right side, and pain or uneasiness in the tip of the right shoulder, or under the shoulder-blade. Similar symptoms are sometimes spoken of as torpor of the liver. When such symptoms exist in a minor degree, the person is regarded as bilious. Biliousness may, however, be evidenced by dyspeptic headache.

The *treatment* of active congestion of the liver consists in the avoidance of those factors mentioned above that predispose to it. Warm covering to the part and a light non-stimulating diet are essential. If pain is severe a poultice over the liver will give relief. At night take one or two pills of Prescription No. 65, and the next morning, if necessary, 1 ounce of Prescription No. 27. The bowels must be kept well open. As the patient gets better moderate exercise should be taken; but even after that alcohol must be strictly avoided. If the condition is obstinate a change home and the discipline of a spa is advisable. Should the symptoms persist or be accompanied by rise of temperature a doctor should be consulted at once, as it may be indicative of actual inflammation of the liver and amenable to emetine treatment.

Liver, Inflammation of the. The causes of inflammation of the liver, or hepatitis, are similar to those of active congestion, above described. But there is one other important factor, and that is the connection of liver inflammation with amœbic dysentery (*see* p. 120). The same amœba which causes this dysentery may travel from the bowel to the liver, causing inflammation there, which may go on to abscess. It is very important to recognise this, because in emetine we have a specific remedy against the amœba, and so can prevent abscess coming on. It is also important to know that the dysentery may have occurred several months previously and have been forgotten, or may even never have been recognised. There may have been only a mild diarrhoea or not even that.

The *symptoms* of inflammation of the liver are: Pain in the right side, increased by pressure under the ribs, by a long

breath, by coughing, by lying on the left side. There is also pain in the shoulder, and often a dragging sensation at the pit of the stomach. The whites of the eyes may turn yellow, the urine is highly coloured, there is nausea or vomiting, there may be either costiveness or diarrhoea. The disease is generally marked by febrile symptoms, but in some case there is little fever. Sometimes it may be distinctly made out that the liver is enlarged, but this is not always the case. Sometimes the fever is the only thing complained of and it may be high and continuous, or only with an evening rise.

For the *treatment* of hepatitis a doctor should be consulted at once as he may be able to determine by microscopical examination or otherwise whether the amoeba is causing the inflammation. Meanwhile no harm can be done by hot fomentations over the liver, and if pain is severe there, six to ten leeches. An ounce of Prescription No. 27 should also be taken unless diarrhoea is actually present. If no doctor is available, give a course of emetine-bismuth-iodide as described in the first part of the treatment for dysentery on page 122. If emetine is unobtainable, give ipecacuanha powder by the mouth in one dose of 40 grains, preceded by 10 minims of tincture of opium taken 20 minutes previously. But do not delay in taking the patient to a place where he can obtain skilled aid and more active treatment.

Liver, Abscess of the. Liver abscess may be due to various causes, and there may be one or many abscesses present. But much the commonest kind in India is one abscess only and that due to the action of the amoeba that has travelled to the liver from the large intestine. In this connection all that has been said under Amoebic Dysentery should be read here so that the connection between the two may be understood. The symptoms of hepatic abscess may show themselves in various ways :

(1) *Rapidly, during an attack of inflammation of the liver.* If during such a condition shivering occurs, followed by cold sweats, obstinately furred tongue, scanty and high-coloured urine, depositing much sediment, fever increased at night, and diarrhoea, there will be every reason to fear formation of abscess.

(2) *Gradually, or during chronic inflammation.* The most frequent manner, however, in which abscess manifests itself is after the prominent symptoms of acute inflammation have been relieved. The patient does not recover health, remains

weak and languid, and after a variable period experiences occasional chills, with feverishness towards evening. This soon assumes a hectic character, and is accompanied by a tongue furred in the centre, red at the tip and edges. Weight and uneasiness are experienced in the right side, and the palms of the hands are dry.

(3) *Insidiously, or without previous inflammation.* But liver abscess sometimes occurs without any previous decided symptoms, or there may be simply loss of flesh, or a vague sense of uneasiness, or obtuse dull pain, or a feeling of weight in the side, with perhaps slight cough. These anomalous feelings are signs often scarcely appreciable; or, if observed, are considered too trivial to induce application for medical advice. Often it is not until shivering and cold sweats, with swelling of the liver appear that the serious nature of the disease is recognised.

(4) *During the progress of dysentery.* If the languor, the emaciation, and evening fever are greater than can be accounted for by the violence of the dysentery, if the tongue becomes furred in the centre and red at the tip and edges, and if there is uneasiness and weight in the side there will be little doubt that abscess has occurred. A fit of shivering in addition would render the matter certain.

When abscess forms it may appear as a swelling in the side or near the pit of the stomach, when it is said to point externally; or it may burst into the stomach and be emptied by vomiting; or into the bowels, and the matter may pass away in the stools; or into the lungs, when the contents may be coughed up; or otherwise into the cavities of the chest and bowels, from which there is no escape.

The presence of an abscess should, however, be recognised before it has gone so far as these signs would indicate.

In the absence of medical aid the *treatment* of liver abscess must consist in the administration of emetine-bismuth-iodide as described under inflammation of the liver, and in this case the drug should be continued for 10 days. If the abscess points, do not open the abscess, but get the patient under medical aid as quickly as possible. In the absence of emetine ipecacuanha powder in drachm doses is to be given, as described on the preceding page. If the dose is vomited, repeat it.

Liver, Cirrhosis of the. Cirrhosis of the liver is of the nature of a chronic inflammation of the organ. In course of

time the liver becomes hard from the fibrous tissue that is formed in it, and usually shrinks in size. In Europe the commonest cause is chronic alcoholism; in India there are other causes at work, that act through the bowel.

In cirrhosis of the liver the countenance becomes sallow, the skin dry, the patient despondent and debilitated. The stools, which may be loose or the reverse, are generally clay-coloured, while the urine is often high-coloured from bile. Sometimes the person becomes jaundiced. Discharge of blood from the bowels and bleeding from the nose are also liable to occur. The face becomes pinched, and the limbs thin, though the belly often is prominent. Sometimes dropsy of the belly occurs and the patient has to be tapped.

The complaint is a chronic one and a doctor must be consulted for *treatment*. All *spices* in food are to be avoided as well as all alcohol; and the bowels must be kept open, if necessary, by morning saline draughts.

Lumbago. This term implies severe pain and tenderness of the muscles of the loins, aggravated by motion, often preventing the patient from walking, and frequently occurring suddenly. It is a variety of chronic rheumatism or fibrositis. Lumbago often arises from cold or follows unaccustomed exertion, such as digging or similar muscular strain. But though one of the events mentioned may be the immediate exciting cause of the attack, there is more often than not a predisposing cause which it is more important to discover than the existing cause. The predisposing cause of lumbago or of other focus of fibrositis or of muscular rheumatism, is often a small focus of septic matter somewhere in the body and sometimes not making its local presence obvious. The septic focus may be in the teeth, the tonsils, in of the sinuses connected with the nose, in the appendix or in some other part of the bowel, in the urinary tract or elsewhere; and sometimes a very thorough overhaul with the aid of X-rays is necessary before the seat of trouble can be detected. One of the first things to do is to have the teeth X-rayed, because it is not uncommon to find there is unsuspected trouble at the apex of one or more teeth.

From what is said above it is evident that the most important part of *treatment* is to try to discover and then to remove a possible focus of sepsis. For this purpose the patient must put himself in the hands of his medical man aided by radiologist and pathologist: treatment of a

predisposing cause when found will be in accordance with its nature and site, apart from that a similar treatment may be adopted as that given for sciatica. The same remedies, internal and external, are of avail. Keep the bowels open and apply hot fomentations locally. Ironing the back with a hot flat iron, a piece of brown paper intervening, is often beneficial.

Meningitis. Meningitis or inflammation of the membranes round the brain and spinal cord may occur as an infectious fever called cerebro-spinal fever, an account of which is given on p. 45. Meningitis may also result from injury or extension of inflammation from the outside to within. Or meningitis may occur as a complication of certain fevers such as pneumonia, enteric fever, or small-pox.

But the commonest cause of all meningitis is the tubercle bacillus, and a fuller and separate account of tuberculous meningitis will be found under the head of Tuberculosis.

Myxœdema. Myxœdema results, except under conditions noted on pp. 179, 180, more in connection with atrophy or shrivelling of the thyroid gland than with enlargement. It is characterised by swelling of the skin, especially of the face, which appears enlarged, and of the hands, which lose shapeliness. The skin looks dry and rough; but the skin does not pit on pressure with the finger as in dropsy, the cause of the swelling being not water but a gelatinous (*colloid*) deposit. A similar deposit takes place in internal organs. Irritability of temper, slowness of speech, loss of memory, are other results. The malady principally occurs to adult females.

Myxœdema can be cured by administration of thyroid extract in tablets, under medical supervision.

Neuralgia. The term neuralgia is applied to pain along the course of any nerve, when there is no evident disease of the nerve such as inflammation, neuritis. Very often neuralgic pain is really 'referred' pain, the cause of the trouble being somewhere else (*see p. 33*). Although neuralgia may be in any part of the body, its commonest situation is on the face. It is usually confined to one side of the face, and comes on suddenly. The pain can be most severe. Often it leaves after a certain number of hours, to recur again the next day at the same time. This may go on for several days or weeks, and then be cured. Or a period of remission may extend over months, after which the pain may start again.

In the *treatment* of neuralgia we must consider first of all the cause. Very often the pain is referred from a carious or otherwise unhealthy tooth, even though the tooth should itself be painless. A dentist should be consulted. The next most common local cause is an error of refraction in the eyes, for which purpose an oculist should be seen. Apart from such local causes, sometimes general diseases such as malaria, syphilis, anæmia, rheumatism, and gout may be the cause of the neuralgia and by treatment of these conditions cure may be obtained. Sometimes it is impossible to find a cause. There are some cases that do well if an immediate aperient, such as 4 grains of calomel, is given. In other cases if no local cause has been found, nor any special indication amongst the general diseases named above, give 10 grains of quinine sulphate in the morning and 5 grains in the evening; even in non-malarial cases this often does good. In addition to that take Prescription No. 55, to each dose of which add 5 grains of butyl-chloral hydrate and 10 minims of tincture of gelsemium.

If that gives no relief try 10 grains of aspirin, and lie down in a dark room for half an hour. In addition to these internal medicines, the painful course of the nerve may be painted with aconite liniment, or rubbed over with a little menthol.

Neurasthenia. Neurasthenia is a condition of weakness or exhaustion of the nervous system, giving rise to various forms of mental and bodily inefficiency. It should be understood that neurasthenia is a distinct disease from hysteria—though the two resemble each other in some ways. Hysteria is a disease of the mind; neurasthenia is a disease of the bodily nervous system with a definite physical cause. Neurasthenia is extremely common in India, both in Indians and Europeans. The hot-weather, early-morning irritability of the average European male in India, commonly called 'liver,' is an example of neurasthenia. One cause in India is the trying climate; this, together with overwork and worry, are the principal causes. The East was not intended to hustle in; but the modern demand for efficiency and the strain of competition have been introduced, and tire out the conscientious worker before his time. Neurasthenia or nerve weakness is likely to accompany any other form of fatigue or weakness, such as that following a long illness, especially enteric fever. Other causes are abuse of drugs, alcohol,

or sexual excesses. One strong predisposing cause lies in heredity—some people are born with neurotic constitutions.

The sufferer may appear physically debilitated, or he may not seem much altered. His face, as a rule, shows chronic tiredness. He is usually extremely irritable: if a woman, she may be emotional. He worries unnecessarily over trifles that he knows to be trifles; but is unable to persuade himself not to do so. Sometimes his mind is unusually active: this may be the case at night when he should be sleeping, and so he often suffers from insomnia. Sometimes gastric symptoms predominate, and he is dyspeptic and constipated (see Nervous Dyspepsia on p. 167). Fatigue comes very quickly after any occupation he takes up. He often jumps at any noise, and is readily startled. The neurasthenic is, in brief, easily tired and easily frightened.

For all this there is a physical cause, and the *treatment* is to remove it. Obviously for a tired nervous system the correct thing is rest and a holiday is necessary for the neurasthenic; a quiet holiday with a suitable friend. If he suffers from insomnia he should, if possible, go home to England, as once insomnia starts it may be obstinate.

Apart from this the gastro-intestinal canal requires attention. In some cases the neurasthenia is due to accumulation of decomposing products in the large intestine. Read the article on Constipation, and adopt the measures therein given for promoting movement of the large intestine.

In those physically equal to it, cold baths and moderate exercise should be adopted. If the condition has become severe, especially if there has been insomnia, the use of hydrotherapy in a sanatorium is indicated, or even a modified rest cure.

Either of these courses may be followed by a holiday in a bracing climate, or a month in Switzerland. Sometimes a motoring tour makes a good after-cure, especially where there has been insomnia. Massage is also useful.

Drugs should be avoided as much as possible. The glycerophosphates may be taken in moderation under medical advice. But the patient must not be led astray by the numerous advertisements for drugs and foods, British, German, or American for so-called 'brain-fag' that abound in papers and magazines. A little faith will go a long way; the patient should decide that he is going to get better, as

undoubtedly he will, and this decision will accelerate his recovery.

Neuritis. Neuritis means inflammation of a nerve, and this may occur as a sequel of some fevers, as enteric fever or malaria, or it may result from the effect of certain poisons as alcohol, or it may result from cold. A good example of the last cause is seen in the facial paralysis which may result from exposure of the face to a cold wind, as for instance at an open carriage window. In this case a neuritis of the facial nerve occurs.

When inflammation of several nerves in different parts of the body occurs simultaneously, the condition is called multiple neuritis. Multiple neuritis is a feature of certain diseases, notably beri-beri and leprosy.

When only one nerve is affected, called '*simple*' neuritis, there is not usually much disturbance of the general health. The chief feature is a partial or total loss of function of that nerve. As a nerve has both motor and sensory functions, either or both of these may be lost. Thus the part may be paralysed. Usually pain is the principal characteristic; pain of a boring or stabbing nature, felt along the course of the nerve and in the parts to which the nerve is distributed. The complaint may last for days or months.

The *treatment* of simple neuritis must depend on the cause, and it is by no means always easy to ascertain this. A physician must be consulted, not only for purposes of diagnosis, but also to advise on the uses of electricity and massage, which will vary in individual cases. If malaria is the cause, energetic treatment by quinine should be undertaken. In any case Prescription No. 52 is likely to be of benefit.

In cases of *multiple neuritis* there may be fever, and there is likely to be more general disturbance than in simple neuritis. The causes of this condition are so numerous, lead poisoning, alcohol, diphtheria, beri-beri, leprosy, and others, that the layman cannot expect to be able to diagnose between the different varieties. The appearance of the patient varies according to the nerves affected: thus in the alcoholic form the legs are chiefly involved, and besides paralysis of the lower limbs there is usually much pain felt on pressing the calves. Multiple neuritis from immoderate use of spirituous liquors chiefly affects women. The onset is gradual, with pain, followed by numbness in the feet and legs, weakness of the knees, loss of power, and uncertain gait. This is a

peripheral paralysis, or one that begins in the ends of the nerves farthest away from the spinal cord. As the disease advances the legs waste, and the person becomes bedridden. The arms are rarely affected. The malady is generally ascribed to an accident or chill, the habit of drinking being concealed. Recovery is likely even when the disease has made considerable progress, provided that all alcoholic drink is strictly avoided.

In the *treatment* of multiple neuritis of any form rest in bed is essential. If there is fever, in the absence of an indication to treat any particular cause, give Prescription No. 59 three or four times daily.

Benefit may be obtained from electricity and massage, but skilled advice is necessary on this matter.

Obesity. Both Europeans in India and Indians often grow very stout; and sometimes this increase of size occurs rather suddenly, not only giving rise to inconvenience, but sometimes constituting disease. The cause is, probably, too much fat forming food and too little exercise at that period of life when the accumulation of fat is probable. When the fat is equally distributed about the body no immediate disadvantage may be experienced; but when it is accumulated in distinct parts, interfering with the functions of particular organs, its evil influence becomes apparent. The heavier man carries greater bulk, and his heart has to propel into a larger mass of tissue, a larger amount of blood. Hence one form of evil, *viz.*, an overworked heart, results from accumulation of fat, and is characterised by shortness of breath, and sometimes by palpitation. In addition to this, fat may collect about the substance of the heart, giving rise to the malady known as *fatty infiltration* of that organ. Besides the above symptoms there may also be attacks of giddiness and fainting, while unusual exertion may even cause sudden death. The subjects of fatty heart are usually much distressed on exertion, such as going upstairs, especially in the hot weather.

Fatty heart is a dangerous malady, as it may lead to dilatation of the organ, and any suspicion of such affection should lead to application for medical advice. In the meantime, persons so affected should avoid all kinds of sudden or unusual exertion, hurry, or excitement, should reduce their diet and take regular, but not violent, exercise in the open air.

I must be recognised that certain people have an hereditary tendency to obesity, and such are extremely difficult to treat as they are likely to become fat in any case, although

with care the adiposity may be kept within reasonable bounds. Apart from such hereditary tendency, when a man is growing fat the first great principles of prevention are less food and more exercise. If he leaves off fatty and carbonaceous foods, of which butter and sugar may be taken as the types, he will achieve his purpose the more quickly. There is no royal road both to become thin and to keep so. No system of dietary will achieve this. But spare food and physical exercise will do so.

Amongst exercises, cycling, horse exercise (not a mild walk on a confidential gee), and skipping are suggested ; but the form and amount of exercise must be carefully adapted to each case. Massage of a vigorous kind is also useful.

The second great principle of prevention is the avoidance of those articles of food which are known, when taken in excess, to produce obesity. Fat of meat, bacon, fat pork, bread, butter, thick soups, salmon, stews, preserves, beer, wines, liqueurs, articles containing much starch, as potatoes, tapioca, rice, arrowroot, and sago, sugar, all forms of pastry, duck and goose, peas and broad beans, carrots and beetroot, ices, crystallised fruits, cream and milk (except in moderation), cocoas and sardines, are all to be absolutely avoided in most cases, while in others they can be allowed only in the greatest moderation. For sugar saccharin should be substituted. Other articles allowed are clear soups (a little only), eggs, fruit, green vegetables (except those named), thin toast, Ryevita crisp bread, gluten and almond bread, biscuits and milk in great moderation, junket, poultry, meats (except those named), tea and coffee.

It is better to avoid all alcohol, though in cases where the deprivation is felt, weak whisky and water may be taken in moderation between meals. Besides this, the entire quantity of liquid taken, of all kinds, should be reduced to a minimum, and that taken not less than two hours after meals. There are some cases of obesity that are benefited by thyroid extract, taken thrice daily ; but this should only be taken under medical advice and observation, as otherwise harm may be done.

Apart from thyroid extract, and apart from the importance of maintaining a free action of the bowels, by saline draughts if necessary, there is no drug treatment of obesity. This fact should be well understood as there are so many otherwise intelligent people who, believing the advertisements they read in the papers, waste their time and money on so-called

obesity remedies. The Spa treatment of obesity is of value. The regular regimen and discipline both as regards food and exercise produce great benefit. The loss of weight and the condition of the patient is under a strict medical control.

In brief, we advise one who is threatened with obesity to consult a doctor before adopting any form of treatment or changing his usual mode of life.

Palpitation. Palpitation means consciousness of the heart's action. We are usually unaware that our heart is beating, but under some circumstances we become uncomfortably aware of its action. Often then it beats too frequently. But, as a rule, palpitation is not a dangerous symptom and does not signify disease of the heart itself. Usually it is caused by indigestion, especially with flatulence, and the reader is referred to the section on Dyspepsia for relief of that condition. It is more liable to occur in those of excitable nervous disposition, especially in women, and is common in them at puberty, during menstruation, or at the change of life. It also occurs in anæmia, neurasthenia, and from the over use of tea, coffee, or tobacco. It is not uncommon during pregnancy. Palpitation usually comes on in short attacks, but may be more or less constant. Though commonly due to one of the above causes, yet palpitation may arise from serious disease of the heart.

Palpitation arising from disease of the heart and palpitation depending on other causes may be distinguished as below :—

**PALPITATION DEPENDING ON
DISEASE OF THE HEART**

Equal in two sexes.
Comes on gradually accompanied by breathlessness.
Constant, though more marked at one time than another.
Frequently accompanied by pain in the left shoulder.
Lips and cheeks often livid, and countenance florid.
Often not much complained of by the patient.
Sounds of the heart altered.
Increased by exercise.

**PALPITATION ARISING FROM OTHER
CAUSES**

Relieved by rest.
Most common in women.
Comes on suddenly.
Occurs with intervals of perfect freedom.
Frequently accompanied by pain in the side.
Countenance pale.
Usually very much complained of.
Sounds of the heart healthy.
Often relieved by exercise.
Often relieved by remedies for flatulence.

Palsy, Scrivener's, or Writer's Cramp, is a local spasm or, in bad cases, a local palsy. In the spasmodic variety

attempts to write call forth uncontrollable movements of the fingers or wrist, so that the pen starts up and down, and a mere scrawl results. This is generally accompanied by pain or 'cramp.' In other instances the pen cannot be held and the wrist is almost powerless. There is a tired feeling in the latter part, in the ball of the thumb and in the little finger. Occasionally the arm is painful to the elbow. The causes are, too much writing, aided, often, by general debility from other causes, and especially by an originally wrong education in the method of writing. The only means of relief is perfect rest from the accustomed work, frequent and regular massage and strengthening the system by tonics, fresh air, and exercise. As prevention is better than cure, the first warnings of this malady, *viz.*, a tired feeling in the thumb or little finger after writing, should be accepted as a hint that the parts are being used too much.

In true writer's cramp the outlook is not good ; it usually means permanent abandonment of penmanship unless the amount of writing to be done is very small. The disability however is only for the particular movement that brought on the palsy : and so the sufferer from writer's cramp should set to work to learn typewriting. That is allowed to him.

Among telegraph clerks and typists a similar kind of cramp occurs. Pianists, bricklayers, and sailmakers suffer from a very similar affection, caused by continual strain on the wrists, involved by their employments. The remarks under 'Writer's Cramp' regarding prevention and cure are applicable.

Paralysis. Paralysis signifies loss of the power of motion of any part of the body. It is sometimes accompanied by loss of sensation over the same area and by other nervous changes.

There may be paralysis of one limb, either an arm or a leg, this is called *monoplegia* ; or paralysis of one or both sides of the face. Or there may be paralysis of both legs, the arms being healthy ; this is called *paraplegia*. Or one-half of the body may be paralysed, that is to say, the right half of the face, the right arm and the right leg ; this is called *hemiplegia*.

Paralysis may arise from injury or disease of the nerves, of the spinal cord and its membranes, or of the brain and its membranes. When one limb is paralysed, *i.e.*, *monoplegia*, the most likely cause is neuritis (*see* p. 211), which is a disease of the nerves. Sometimes, as in multiple neuritis,

more than one limb at a time may be paralysed from nerve disease.

In paraplegia the cause as a rule is in the spinal cord. For instance, in such a disease as locomotor ataxy, the spinal cord is affected. A disease of a somewhat different type, but one which also has its seat in the spinal cord, is infantile paralysis, of which a fuller account is given in Chapter XVII. In infantile paralysis the upper or lower limbs may be picked out independently as in nerve paralysis.

In hemiplegia the seat of affection is in the brain, on the opposite side to that on which the paralysis is evident. Hemiplegia commonly follows apoplexy, as described on p. 137.

Paralysis of one side of the face is quite a common condition due to inflammation of the nerve trunk to the face, brought on by a draught. It usually clears up in 3—4 weeks, but may take longer. As other more serious conditions may be confused with this type of paralysis, it is as well to consult a doctor.

Something may be learnt also from the method of onset of the paralysis. Thus it may come on :

(1) *Suddenly.* The patient, apparently healthy, is paralysed in a few seconds. Such an onset is seen in apoplexy (p. 135), and is due to sudden destruction of nervous tissue from breaking of a blood-vessel or to blocking of a blood-vessel.

(2) *Rapidly.* The paralysis establishes itself in the course of a few days. Such an onset is seen in infantile paralysis and in most cases of multiple neuritis, and is characteristic of inflammation of the nervous matter.

(3) *Gradually.* The paralysis may be many years coming on sometimes with temporary improvements, but on the whole tending to a slowly progressive advance. This onset is seen in many spinal cord diseases, such as locomotor ataxy, and is characteristic of gradual degeneration of the nerve matter.

It would be out of place in this book to go further than the above in the differentiation of the forms of paralysis: since high medical skill is required very often to diagnose between the various nervous diseases that produce apparently similar conditions. A fuller account of some of the commoner diseases producing paralysis, as infantile paralysis, apoplexy, and neuritis, is given elsewhere in this book under those headings. It should be remembered also that hysteria may produce paralysis apparently similar to that caused by gross nervous disease.

The *treatment* of paralysis will depend upon its cause. The more obvious indications have been given under the other headings already mentioned.

Pleurisy. Pleurisy is inflammation of the pleura or serous membrane covering the outside of the lungs and lining the inside of the chest, and separating one from the other. Under normal conditions the two surfaces of the pleura are in contact, moistened by serous fluid which the membrane secretes. At the commencement of acute pleurisy there is, generally, shivering followed by fever, and by pain, or 'stich,' in some part of the chest. This in a few hours becomes acute stabbing pain, and is generally most felt in the side about the level of the nipple, shooting to the front of the chest, to the collar-bone, or to the armpit. There is short, dry cough, the breathing is short and catching, being frequently attended by an expiratory groan, and the pain is increased by coughing, by taking a long breath, or by lying on the affected side. The temperature may rise to between 100° or 102° F., or sometimes higher.

Pleurisy may be caused by cold or by injuries, and often arises during the progress of fevers. It may follow fracture of the ribs; may precede or follow an attack of pneumonia, and in one variety is due to the presence of tubercle. In some cases there is an effusion of watery fluid between the lungs and the chest wall, forming a dropsy of the chest. In favourable cases the acute pain and fever subside about the fourth or fifth day; but if there be much fluid effused, the cough and difficulty of breathing may persist indefinitely.

Pleurisy may be distinguished from inflammation of the substance of the lungs (pneumonia) by the following points: the onset of pneumonia is as a rule more sudden than that of pleurisy; the fever in pneumonia tends to run at a higher level and there is greater distress of breathing; there is likely to be more frequent cough in pneumonia than in pleurisy and there will probably be more phlegm expectorated in the former disease, in which case also the phlegm may be bloody or rusty; in pneumonia as a rule the patient looks more seriously ill than with pleurisy alone. But it is to be remembered that pleurisy frequently, in fact usually, accompanies pneumonia, and that most of the pain felt in pneumonia is really due to the pleura being affected.

Mild cases of pleurisy may also be mistaken for the neuralgic pain in the side known as pleurodynia (*see* p. 219), and

vice versa. Pleurodynia is distinguished by its generally affecting the left side in women, and by there being no attendant fever.

Treatment. The patient must be in bed, warm and kept free from draughts. He should move and talk as little as possible, as motion accelerates the breathing and increases the pain. The diet should be light. Over the site of the pain hot fomentations should be applied, and a jacket poultice (see p. 579) is often a comfort to the patient. When the acute pain has subsided and frequent local applications are unnecessary, the ribs should then be immobilised as far as possible by means of strips of diachylon plaster, each about 2 inches wide and overlapping the strip next to it, placed round the affected side of the chest; the strips to extend beyond the middle line both in front and behind. Prescription No. 39, 1 ounce thrice daily, may be given; or if the cough is unusually troublesome teaspoonfuls of Prescription No. 53 at times. For restlessness at night 1 ounce of Prescription No. 32 is useful. For the treatment of watery effusion in the pleura see below under Chronic Pleurisy.

Pleurisy, Chronic. Chronic pleurisy is sometimes a consequence of the acute form, but often it commences as a sub-acute disease, generally in those subject to tuberculosis. As a result of the thickening of the inflammatory exudation, adhesions often form between the two layers of the pleura. If extensive they may cause some difficulty in breathing, but as a rule the effects are not serious. In either case feverishness at night, a permanently quickened pulse, difficulty of breathing increased on exertion, and inability to lie on the healthy side are the principal symptoms. These symptoms may be more or less severe according as the pleurisy is of greater or smaller extent. Such a condition is apt to alternate with symptoms of the more acute form, such as more severe pain, and fever of a hectic nature. Chronic pleurisy may exist for months or years, the person so affected sometimes feeling little of the ailment. at other times suffering from repeated sub-acute attacks. But in such patients the breathing is generally difficult, particularly on exertion, and there is tendency to night fever and night sweats. Such pleurisy is nearly always tuberculous, and very frequently the lung is tuberculous at the same time. The section on Tuberculosis, p. 225 *et seq.*, should be read.

One result of either acute or chronic pleurisy may be

accumulation of fluid in the cavity of the pleura, or space (not present in health) between the lungs and walls of the chest, or accumulations of pus in the same position, called empyema. These conditions may be suspected when, after pleurisy, night fever and pain remain, when the person grows emaciated, and when one side of the chest appears more prominent than the other. Such a condition requires skilled medical attention. It is often necessary to draw off the fluid : and if the fluid is found to be purulent, a surgical operation is often necessary.

The *treatment* of chronic pleurisy depends principally on its nature. Relief for the pain may be obtained from local applications such as a mustard plaster or a blister (*see* p. 595), or from daily painting iodine, Prescription No. 9, over the painful part. But as the nature of the disease is usually tuberculous, treatment directed against that is required. The reader is referred therefore to p. 225.

Pleurodynia. Pleurodynia is nervous pain generally occurring in the left side, and especially to debilitated women. It may be associated with dyspepsia, neuralgia, or rheumatism. A poultice on the side will usually give relief : sometimes it may be necessary to strap the side, for which see the description given under Pleurisy. For the distinction between pleurisy and pleurodynia *see* p. 217. In cases of rheumatic association Prescription No. 58, 1 ounce thrice daily, will be useful.

Rheumatism. True rheumatism, that is, acute rheumatic fever and sub-acute rheumatism of childhood has been dealt with elsewhere (p. 96).

So-called chronic rheumatism is a name applied to a number of pains, aches and swellings more or less connected with the joints of the body, and due to a multitude of causes. The majority of rheumatism falls into three groups :

(a) *Muscular rheumatism.* See Lumbago and Stiff neck and Sciatica.

(b) *Chronic rheumatism of the joints.* This falls into two sub-groups :

(a) Rheumatism due to chronic infection of the teeth, tonsils or other parts of the body—gonorrhœa being a particularly potent cause.

(b) Rheumatism due to chronic degenerative changes or wearing out of the joints in old age or following injury.

Treatment. The first thing to attend to is the removal of the causes by which the malady is kept up. Small areas of sepsis should be diligently sought for. Rooms with damp floors and walls, insufficient clothing, and absence of nourishing diet, are among the most prominent. Internal remedies are not often of use; though benefit may be obtained from Prescription No. 58; or 10 grains of acetyl-salicylic acid in powder or tablet thrice daily—this is the drug that has a reputation under its German name of aspirin; or 10 grains each of guaiacum powder and potassium iodine in cachets thrice daily. Massage is often of great benefit and Turkish baths are of use. Residence at a spa, especially with hot alkaline springs as at Bath, is often the best thing. Apart from spas climatic treatment is also good; the locality chosen should be dry. Benefit may also be obtained in some cases from vaccines and similar specific injections and from the local application of drugs by the tonic method; and from baths of radiant light and heat.

Sciatica. Sciatica is a painful affection, sometimes neuralgia, sometimes neuritis (*see* p. 211) of the large nerve passing down the back of the thigh. There is acute, agonising pain extending from the buttock to the ham or further down the leg. It is known from rheumatism by the pain, being limited to the course of the sciatic nerve, and continuous, although aggravated by motion, and increased by pressure. But sometimes the muscles near the nerve are also affected with rheumatism, when the distinction is not so clear, as the pain is felt in the whole of the back part of the limb instead of in a line nearly in the centre. It may originate from cold, or from sitting on a wet seat; or, in more rare cases, it is a consequence of constipation, being then on the left side and produced by the direct pressure of fæcal matter in the bowels on the sciatic nerve before it passes from the pelvis. Sciatica may be a symptom of a tumour pressing on the sciatic nerve; so it is necessary to go to a doctor to find out if that is so in the particular case.

The *treatment* consists in rest, wearing warm flannel drawers, hot fomentations, the use of the hot flat iron, and mustard poultices or small blisters over the more painful parts. Purgatives, as Prescriptions Nos. 27 and 62, in full doses, should also be given. In cases connected with rheumatism the treatment appropriate to chronic rheumatism should be

employed. Prescription No. 58 taken four times daily may benefit some cases ; but relief is more likely to be obtained from a course of potassium iodide. For this purpose take thrice daily 1 ounce of Prescription No. 56, to which 10 grains of potassium bi-carbonate have been added.

In some cases also cachets, each containing 10 grains of potassium iodide and guaiacum powder, taken twice daily, will relieve when the other medicines have failed. The course of potassium iodide should only be taken under medical observation. Sometimes the pain is so severe that the injection of morphia is necessary ; but aspirin grs. x repeated in six hours if necessary will give relief to most cases. Do not apply massage when the pain is bad, but in between the attacks it may do much good. So also may high-frequency electric currents.

Scurvy. Scurvy is not nowadays a common disease amongst adult Europeans ; it occurs not infrequently amongst Indians who are not getting sufficient fresh food. It occurs also amongst European hand-fed children, who are brought up only on sterilised milk or other prepared foods. There is much popular misapprehension as to the nature of scurvy. Some people think that everyone showing spongy and bleeding gums has a scurvy taint. This is not so ; in nearly all cases this condition is a local disease of the gums alone, and is called *pyorrhoea alveolaris*. It is described on p. 337. Scurvy is a disease of the blood and body tissues generally, and is due to a lack in the food-supply of a vitamin. That is why children fed only on sterilised foods and sailors fed only on tinned or otherwise preserved foods are liable to suffer from scurvy. The chief symptoms of scurvy are great and progressive weakness with a tendency to bleeding anywhere, either from one of the mucous membranes or underneath the skin in the form of a bruise, or into or around one of the large joints. The disease may first be evidenced by soreness of the gums, weariness, dejection of spirits, dull pains in the limbs, palpitation, and shortness of breath. The tongue becomes pale and flabby, the complexion muddy, the lips bluish, or livid, the eyes surrounded by a dark circle. The gums grow more affected, swollen, spongy, and bleed on the slightest touch. The teeth are often loose, the breath foul, and as the disease advances blue spots, like bruises, appear on different parts of the body. Slight pressure or injury now produces a bruise, scratches become ulcers, and old wounds or scars

open afresh. The joints become swollen and stiff, great emaciation takes place, puffy dropsical swellings appear, diarrhoea or dysentery sets in, bleeding may occur from the gums, nose, or bowels, and the patient dies exhausted. The heart becomes weak, and easily affected by shocks, or violent exertion.

Treatment. From the above account of the causes and symptoms of scurvy it is obvious that its prevention is a much simpler matter than its cure. Fresh vegetables should form part of any ordinary dietary : potatoes are especially valuable. Where such are unobtainable by travellers and where fresh limes cannot be got, then fresh meat or milk should be provided. The efficacy of the bottled, artificially prepared lime-juice in this disease has been exaggerated, though it is some good. Any fresh fruit or vegetable is good, though the antiscorbutic powers or vitamin content of vegetables vary. When a body of Indians, such as a regiment or collection of prisoners, cannot obtain sufficient fresh vegetables, it is a good thing to see that they have their dhal or pulse grains whole and allow them to germinate before cooking. This can be done by putting the grain in a moist shallow tray for 24 hours or a little longer when they should sprout. Where scurvy actually exists a similar treatment by fresh vegetables and meats and germinated grain and unboiled milk is necessary. Sodium citrate in 20-grain doses should also be given thrice daily. For infantile scurvy, a teaspoonful of meat-juice with a little mashed potato is excellent. Orange-juice should also be given thrice daily. A separate account of scurvy in infants is given on p. 518.

Sea-sickness. Sea-sickness is a form of brain sickness, due to irregular stimulation of the organs of equilibration, the semi-circular canals, by violent and irregular changes of position and direction. Disorders of the stomach and of the eyes may increase the liability to sea-sickness ; but its direct cause lies in the upset of equilibration. It is unnecessary to describe the symptoms of sea-sickness.

The *treatment* of sea-sickness may consist of a course of preparation for the voyage by one who knows himself to be a bad sailor, and of treatment on the day of embarkation and subsequently. A course of preparation may start from a week previous to embarkation and consist of a preliminary purge and the adoption of a light diet, together with a course of bromides. Prescription No. 55 may be taken twice daily

for this purpose, up to the starting of the ship. The more immediate treatment consists in taking chloretone in 5-grain capsules. There are other proprietary remedies of reputation; but the active principle of the best of them is chloretone. One capsule may be taken in the boat-train, one on going on board, and another as the ship begins to meet the waves. Do not defer the taking of it too long, for the mere fact of swallowing a capsule under adverse circumstances may provoke nausea. If the voyage is to be a long one, the chloretone may be taken again at intervals: thrice daily should be sufficient. In addition to this a firm abdominal belt should be worn, and the expectant sufferer should lie on his back as much as possible. It is much better if he can arrange to do this on deck, and have his food brought him at intervals; only retiring below when absolutely necessary. The food should be light, but starvation should not be aimed at. Acid and salt substances such as a lemon squash to drink, and a little cold meat with pickles, or a cup of Bovril, are usually better borne than other food. In severe cases iced champagne in small but frequent doses may be kept down when other things are not; but some are too ready to fly to this remedy, which should be kept in reserve. For bad sailors undertaking the voyage to Europe from Bombay in the monsoon, a preliminary day in Bombay is advisable to enable them to recover from the long train journey, to repack their luggage so as to avoid much of this labour on board, and to take in a stock of chloretone. Before leaving harbour they should do what unpacking is necessary in expectation of the tossing they may receive a few hours after sailing.

Spleen, Enlargements of the. Enlargements of the spleen is a common accompaniment of disease in India, and may occur in acute or chronic illnesses. For instance in acute diseases, as malaria and enteric fever, the spleen is almost always enlarged, though it may not be so large as to be palpable below the ribs on the left side. The great enlargements of the spleen occur in chronic diseases, and in these the spleen may become so large as to reach right across the belly to the right side. A hard swelling felt coming from below the left ribs towards the belly is usually an enlarged spleen, and this opinion is supported if a notch is to be felt in the edge of the swelling as the margin of the spleen is naturally irregular. With enlargement of the spleen there is usually a history of previous fever, often of high fever that has lasted for weeks

and later of irregular and occasional rises of temperature. The diseases that may give rise to this condition are commonly malaria, kala-azar, and certain abnormal states of the blood, and chronic inflammation of the peritoneum or membrane that covers the spleen as well as the rest of the abdominal organs. It is quite impossible to diagnose between these diseases without microscopical examination of the blood, and this should be undertaken whenever possible. Details of the diagnosis and *treatment* of kala-azar and malaria should be read under those headings. Where examination of the blood and accurate diagnosis is impossible, as malaria is probably the commonest cause of enlarged spleen, at any rate in children, the patient may be treated under the supposition that he has malaria; but it should be remembered that this is only guessing and not diagnosis. In such cases quinine should be given, about 15 grains daily: that is to say, 1 ounce thrice daily of Prescription No. 36. More quinine up to 25 grains daily should be given if the fever is high. If there is no fever at all and the case is very chronic, Prescription No. 51 should be given thrice daily and continued for several weeks. In some cases arsenic is of use also, and 3 minims daily of the liquor arsenicalis should be given if there is no diarrhoea. At the same time, local applications over the spleen will help its reduction in size. If there is pain over that area, hot fomentations should be applied. Otherwise the ointment of Prescription No. 84 should be rubbed over the spleen twice daily. If it causes much blistering it may be made weaker. The application of X-rays to the spleen may also help to reduce its size.

In Europeans, chronic enlargement of the spleen necessitates change to England, or at least to a cooler climate. When British children suffer from enlarged spleen they should be sent home, or, if that is impracticable for the time, to the hills.

Stomach, Disorders of the. The stomach may be disordered by a multitude of causes, the principal of which are improper food, alcoholic liquors, fevers, and other exhausting diseases. Disorders of the stomach in adults will be found described under the head Dyspepsia in this chapter, while the symptoms Hiccough and Vomiting are also dealt with separately under those headings.

Stomach diseases in children are dealt with under various headings in Chapter XVII.

Swelling of the Feet or Legs occurs from causes specified under dropsy (p. 158); and under diseases of pregnancy (p. 468); or at the change of life (p. 446); or from scurvy (p. 221); or from enlargement of the spleen (p. 223); or as a consequence of anæmia (p. 131) or of debility or of heat. Swelling of the feet is common in India, especially towards night: the swelling subsiding with the rest in bed at night. As this swelling is a symptom and not a disease in itself, the cause should be sought for and treated.

Tuberculosis. Tuberculosis is a disease due to the activity of the tubercle bacillus. The bacillus may be present in any part of the body: most commonly it is in the lungs. Infection of the healthy by this bacillus is caused either by their inhaling or swallowing it. Usually tuberculosis is caused by inhalation of the bacillus from dried phlegm that has come from a previous case of tubercle of the lungs. But it should be recognised that tuberculosis is of the same nature in any part of the body, and that a case of tubercle of the bowels in one person or of the brain in another may arise by infection from a third person suffering from tubercle of the lungs. We will now give accounts of the commonest forms of tuberculosis.

(1) *Of the Lungs.* Tuberculosis of the lungs is commonly known as phthisis or consumption. It is extremely common. Taking the civilised world as a whole about one person out of every nine born dies of phthisis; and these figures appear to be correct for India also. It used to be thought that consumption was hereditary; but this is impossible, as one cannot inherit a bacillus. What may, however, be inherited, is a weakness that may allow the patient to be a more suitable soil for the growth of the tubercle bacillus than his fellow. Only in that sense, that one may inherit a liability to the disease, can consumption be called hereditary. Consumption without infection by the bacillus is impossible. There are in fact three factors necessary to produce consumption in any case; one of these is the bacillus. Another is the general weakness, either inherited as already spoken of, or else acquired after a long illness or from work especially in badly ventilated rooms, or from insufficient food, or from intemperance of any kind. These two factors together will give the patient tuberculosis. The third factor is a local weakness in the lung, and it is that factor that decides the bacillus to settle in the lung in cases of consumption in preference to settling elsewhere in

the body. That is why consumption is so common after prolonged bronchitis, especially in children who have had bronchitis after measles or whooping-cough.

As so much depends upon the early diagnosis of consumption, because when we get the patients early enough we can usually cure them, therefore, it is important to know how consumption usually begins. One or more of these three symptoms is usually the first :

(a) *A cough.* The cough at first is usually a dry one, later on there will be phlegm unless a cure is brought about early.

(b) *Fever.* The fever at first will be slight, and in the evening only. Or perhaps a little feverishness is felt after meals or after exertion. If no attention is paid to this and the disease progresses, the fever will become more evident ; it may become continuous or last longer than it did before, and be followed by sweating, especially at night.

(c) *Dyspepsia.* Sometimes dyspepsia is the earliest and only symptom of tubercle of the lung, and for some time there may be nothing to direct attention to the respiratory organs. Most consumptives suffer from loss of appetite and feel repugnance to certain foods, especially to fats.

Sometimes the first sign of anything being wrong is bleeding from the lung (*see Spitting of Blood on p. 141*). When the blood spat up is only a little these people may be considered more fortunate than their fellow sufferers, because the spitting of blood indicates that there is something strikingly wrong and sends the patient at once to a doctor. Thus this patient comes under proper treatment relatively earlier than his fellows, and so he has more chance of recovery. Yet other patients may have no symptoms at first beyond continued lassitude, and poor general health, with gradual wasting. Sometimes at first a patient is rather pleased to find he is getting thinner ; but loss of weight should take him to a doctor. Other cases of consumption may begin by showing tuberculosis of the pleura or of the glands, whence infection may spread to the lungs. The great majority of consumptives, however, first complain of cough and fever, which two symptoms are, as a rule, not far removed from one another in the date of their onset. Anybody suffering from the above symptoms should at once consult a doctor, and should take with him a specimen of the phlegm, if any, that he has spat up that morning. Often the phlegm or sputum will show the presence of tubercle bacilli under the microscope, and when

the doctor sees these, then there is no doubt at all that the patient has tuberculosis. If no bacilli are found, however, it does not follow necessarily that the patient has not got tuberculosis; early cases do not show the bacillus. The patient must also buy a clinical thermometer and record his temperature at 6 A.M., noon, and 6 P.M., always keeping the thermometer in the closed mouth *for five minutes*.

The doctor will send the patient to a radiologist and diseased areas in the lung may appear as darker shadows in the picture; but symptoms appear before obvious signs in this disease, so sometimes the X-ray picture will show nothing decisive.

If pulmonary tuberculosis is not efficiently taken in hand early the cough is likely to grow worse, and the expectoration more profuse. Hectic fever occurs, followed by profuse night sweats; and although the appetite may continue good, flesh and strength are lost. There is often a pronounced dislike to fatty foods. There are often now sharp, cutting pains in the side and chest, the patient may lose his voice, and diarrhoea may occur, pointing to the spread of the disease to the throat and bowels.

Treatment. It is absurd to try to conceal from a consumptive the fact or even the possibility that he may have consumption. The facts of the case must be faced by the patient because it is only by his active and intelligent co-operation that success can be attained in the treatment, and he is not likely to do what is required unless he understands fully the position. It has been truly said that no fool ever recovers from this disease; but intelligent people who will subject themselves to the discipline required usually do recover, provided the disease is diagnosed early enough. Half measures are useless. It is absurd for a patient to think that by taking medicine thrice daily he may still continue at his work. Much greater sacrifices are necessary. The moment phthisis has been diagnosed the patient should put himself entirely in the hands of his doctor and, if possible, go to a sanatorium. There are several sanatoria in India for the treatment of pulmonary tuberculosis, notably at Bhowali in the U. P., at Madanapalle in the Madras Presidency, and at Dharampur in the Punjab. Many Europeans, if fit to travel, will do best to go home for treatment. If not, they should try to get to Bhowali or a similar good sanatorium. For those who stay in their own houses there is good advice contained in an eight-anna

booklet by Dr. Warren Crowe, and the writer of this article, called 'Consumption : Home Treatment and Rules for Living, adapted for India.' This booklet is published by Messrs. Butterworth & Co. of Calcutta, and is well adapted for those who are up and about. Those who are not must, of course, rely on their doctor's advice entirely, and should try to get to a sanatorium or, if not there, to the hills, provided they are fit to travel and that their temperature is not over 101 degrees. Cases with high fever do not do well in the hills. We give here the advice that we hand on printed slips to out-patients at the Lucknow Tuberculosis Hospital : it is intended principally for Indians.

YOU ARE SUFFERING FROM A SERIOUS DISEASE OF YOUR LUNGS, AND IF YOU WISH TO RECOVER IT IS ABSOLUTELY NECESSARY FOR YOU TO OBSERVE THE FOLLOWING RULES :

1. It is best if you can leave your house and live in the open air in a shady bagh ; but if you cannot do that you must live in the open air as much as possible, sleeping quite out of doors, or if there is much dew, sleeping in the veranda at night. At the same time you should be sheltered from winds, especially from dusty winds. You must not cover up your mouth or nose when you sleep.
2. You must buy a thermometer and learn to take and record your temperature every morning before you get up from bed and every evening at 6 o'clock. This is to see if you have any fever. The thermometer should be kept in the closed mouth for five minutes.
3. If you are having fever, you must not walk about, but rest on your bed in the open. In any case you should ask the doctor how much exercise you are to take.
4. You should eat as much as you can : milk and ghi and fat things are especially good for you. If you have much fever you should only take light and digestible food, but if you have no fever eat as much as you can of everything.
5. Tell the doctor at once if you have diarrhoea, and if that is so, take only milk and sago and stay in bed.
6. You must give up eating pan and smoking tobacco altogether.
7. You must take great care to keep your mouth and gums clean, rubbing them carefully after every meal. If the

gums are not quite clean then ask the doctor for a mouth wash.

8. All your sputum must be expectorated into a small vessel, which should be emptied and the sputum burned twice a day. It is very dangerous for you to spit on the ground, as by that means other people catch this disease. You should not cough in the direction of other people.

The sufferer from any form of tuberculosis should, unless kept in bed, have himself weighed once a week, and note down his progress or otherwise. The advice about living in the open air requires modification in the hot weather, when it becomes impossible. The hot weather, and rains also, are very bad times for consumptives. The worst things for consumptives are heat, dust, and wind ; and it is difficult to avoid these in the months of May and June on the plains.

Besides the general rules of hygiene and the use of rest we have other weapons with which to fight tuberculosis. One of these is the regular and systematic injection of tuberculin, which, when done in suitable cases and by one skilled in its use, is of benefit. Other special means of treatment, such as putting the diseased lung at rest by means of compressing it with air, are now employed with much success in suitable cases. One important thing to realise is that too much reliance must not be placed on medicines. Medicines are sure to be required to relieve cough : Prescription No. 40 thrice daily will be the most generally employed ; or Prescription No. 53 for occasional use. Cod-liver oil has a great reputation in this disease, and certainly does good in many cases. It may be purchased in one of the advertised proprietary preparations, or taken in the form of Prescription No. 47, 1 ounce thrice daily. Sometimes 1 ounce of Prescription No. 35 taken before meals will help to promote appetite, especially if 1 or 2 minims of liquor arsenicalis be added to it ; but this must not be given if there is a tendency to diarrhoea. Creosote and many of its derivatives, as guaiacol, also have a reputation in the treatment of tuberculosis ; but their efficacy is doubtful, as also is that of the method of treating the disease by dry inhalation. There is at any rate one thing the patient must not do, however, disappointed he may be with the results of the treatment he has been ordered by his previous doctors, he must not fall into the hands of the numerous advertising ghouls who prey upon the flesh of the victims of

this disease. They are unfortunately too numerous, and vary from electrical quacks to self-claimed discoverers of hitherto unknown herbs.

The prevention of tuberculosis is better than its cure. It consists mainly in the burning of all sputum, and cleansing of all utensils used by the patient. The patient should also sleep alone.

Some special features in the nursing of phthisis cases are given in Chapter XIX.

(2) *Tuberculosis of the pleura* frequently accompanies tuberculosis of the lungs. It may occur alone; but too often signs of the involvement of the lung are discovered during the course of the illness. The symptoms of tuberculous pleurisy are like those of any other chronic pleurisy, and will be found on p. 218. Most pleurisy is tuberculous. Besides the treatment given on p. 219 for the relief of the pain in chronic pleurisy, the patient should also, if the case be tuberculous, go to a sanatorium, and be treated in other respects as if he had the bacillus present in the lungs, as indeed he probably has. For instance, treatment by tuberculin is also of use in these cases, and similar medicines, such as cod-liver oil, as recommended in the previous section, should be employed.

(3) *Tuberculosis of the glands* may affect any of the glands in the body. It is especially common in children, and the glands of the neck are those most usually attacked. When tubercle infects glands, it produces chronic inflammation and enlargement of the glands. When several glands are affected they tend to become matted together in one mass. Some glands are found to contain cheesy (caseous) matter, whilst others go on to softening and suppuration. The glands inside the chest and around the bronchial tubes also often become tuberculous in children. They cannot be seen, but the fact that they are enlarged may be evident to a medical man from certain signs or shown by the X-rays. Often tuberculosis of these glands is the starting-point of tuberculosis of the lungs.

Treatment. When a child gets tuberculous glands, he should be taken to a surgeon and kept under his observation from time to time, so that he may note the progress of this chronic complaint, and may perhaps discover a cause of local irritation, and may be able to decide if the glands should be removed; because sometimes it is advisable to

remove the glands by operation, and at other times necessary to evacuate pus that may have formed in them.

Besides this local treatment, the treatment of the general health is most important. An European child should if possible be sent home and should live on the East Coast of England; if kept in India he should live in the hills. Cod-liver oil is an excellent thing for him, Prescription No. 47; or the oil may with advantage be given with one of the extracts of malt. Prescription No. 73 is especially useful for these children; two teaspoons may be given thrice daily. The iodine paint of Prescription No. 9 may be painted over the glands; but it is doubtful if it does much good. When a gland becomes red and soft and appears like an abscess, do not attempt to open it yourself. Take the child to a surgeon and let him decide whether it should be opened or not. Injections of tuberculin are often of the greatest use in the treatment of these glands. But most important of all is attention to the general hygiene of the child, the provision of an outdoor life in a good climate, and the removal of any local irritation, such as enlarged tonsils or adenoids.

Besides the glands already described here, those around the bowels, called the mesenteric glands, sometimes become tuberculous. As this condition usually accompanies tuberculosis of the bowels, it will be found described under that head on p. 233.

(4) *Tuberculous meningitis* is the commonest form of meningitis (see p. 208). It may occur in the course of tuberculosis of other parts, such as the lungs; or tuberculous meningitis may be the first indication of tuberculosis anywhere. In this disease tiny nodules containing masses of tubercle bacilli form on the membranes covering the brain, with inflammation of these membranes and the subsequent production of a watery effusion into the cavities of the brain. But sometimes the tuberculous deposit is not confined to the brain, but also takes place in the lungs and the glands of the bowels. When this occurs the disease is termed *acute general tuberculosis*.

Tuberculous meningitis generally occurs in young children of poor constitution, and is not common after seven years of age. In children thus predisposed it sometimes follows the convalescence from small-pox, scarlet-fever, or whooping-cough. It is often preceded for some time by loss of general health, the child taking food freely but not thriving, and suffering from alternating constipation and diarrhoea. There

is loss of flesh in the body and limbs, but the face is less affected. The child is fretful and drowsy; there are sudden startings during sleep, and often grinding of the teeth. After a variable period, during which these early symptoms may have been so strongly marked as to suggest danger, or so trivial as to have escaped notice, more definite symptoms begin.

These symptoms are likely to commence with intense headache, high fever and obstinate vomiting, which continues whether the stomach is full or empty. One of the most characteristic symptoms of meningitis is obstinate vomiting. The gait becomes staggering, and there is a tendency to cling to surrounding objects. There is squinting and marked aversion to light, from which the child turns the head away; there is alternate flushing and paleness of the face, which is sometimes sad and frowning, at other times vacant and stupid. The skin is harsh and dry, the temperature rising to 102° or 103° F. every evening. There is severe pain in the forehead, coming on in darting paroxysms and causing the child to scream with a characteristic piercing cry. The pain causes the child to put its hands to the head, which is incessantly rolled from side to side. Often a fallacious remission of symptoms takes place; but at a later period, or from one week to three after the commencement of the disease, the face assumes an aged expression, vomiting ceases, diarrhoea sets in, the pulse becomes slower, the child becomes drowsy, insensibility ensues, and the child dies. Or death may take place during an attack of convulsions.

When, as previously referred to, the disease attacks the lungs and bowels, symptoms referable to these organs will also arise. When the lungs are implicated there will probably be cough and also expectoration. When the bowels are affected there will be enlargement of the glands and other symptoms, described as *tabes mesenterica* (see p. 233).

Treatment. If the signs of tuberculous meningitis are established there is not much chance of recovery; practically the only hope is that the diagnosis is wrong. This sometimes is the case, because the diagnosis of tuberculous meningitis in its early stages, even to a medical man, is not always easy. Other less serious conditions simulate it, especially in children. The treatment is mainly palliative. In the sick room the air should be maintained as fresh and pure as can be, only the necessary attendants being admitted, and the utmost quiet being observed. When the child has

to be moved, it should be raised in the most careful manner, without shaking. All sources of irritation must be sought for and removed as soon as possible. Mercury (blue) ointment may be given by means of rubbing half a drachm of it on the child's binder daily. Cold applications, as powdered ice in a bladder, or india-rubber bag, or, this not procurable, evaporating lotions (as Prescription No. 17) should be constantly applied to the head, and every day a mustard poultice or leaf may be applied to the nape of the neck. The proper method of use of these cold applications and mustard poultice will be found detailed in Chapter XX. There are other means such as lumbar puncture and surgical measures, of relieving the intense headache in meningitis; but they require medical skill for their employment.

(5) *Tuberculosis of the bowels* is a common accompaniment of the late stages of consumption; and the diarrhoea, indicating this, has already been mentioned on p. 227. Tuberculosis may also start in the bowels, especially in children and young adults; and the disease may show itself in one or more of three ways. Either the tubercles are present in the intestinal wall and cause ulceration and diarrhoea, often with the passage of mucus and blood; or from the intestine the disease may extend to the membrane, covering the bowels, the peritoneum, giving rise to tuberculous peritonitis. This disease is sometimes accompanied by dropsy of the belly. More commonly the tuberculous infection is in the glands round the bowel, and partakes of the nature of other tuberculous gland enlargements. These glands are called the mesenteric glands and the malady is sometimes known as *tabes mesenterica*. In an early stage there may be nothing but occasional tenderness of the belly, slight fever and loss of flesh. But when the disease is further established, the belly grows large, and constipation may alternate with diarrhoea, and fever of a hectic character and night perspirations become more apparent. The bowels now grow hot and tender to the touch, and the enlarged glands may often be felt hard and knotty underneath the skin. As the disease advances the evacuations change, becoming slimy, bloody, and sour-smelling. The more the child wastes, the more restless and irritable does it become, until it may die from diarrhoea and exhaustion.

The *treatment* of bowel tuberculosis should be principally hygienic. If an European, the child should be sent to England

and live by the sea ; in India, he should be in the hills, unless diarrhoea is a feature of his illness. If there is any rise in temperature, the patient should be in bed. Diet must be light and non-irritating : milk, eggs and other easily digested and nutritive foods should be given. But the quantity and quality of the food must depend largely on the presence or not of diarrhoea. When the belly is tender, especially if there is mild fever, the daily rubbing in of $\frac{1}{2}$ to 1 drachm of iodoform ointment is of benefit. If there is a definite lump of glands to be felt, then mercury ointment, $\frac{1}{2}$ drachm daily, may be rubbed into the belly, the gums being watched for any signs of mercurial poisoning. If there is much pain in the belly, relief may be obtained by hot fomentations. Sometimes, as for tuberculous glands elsewhere, tuberculin may be used with advantage. Sometimes also the glands may be removed by surgical operation. For children, Prescription No. 73 is of benefit in mild cases ; while for both children and adults large doses of creosote, gradually getting up to 10 or 15 minims thrice daily, in mucilage are useful. Where diarrhoea is the principal or only feature then Prescription No. 42, in doses suitable to the age of the patient, should be given four times a day. If there is much pain, add 5 minims of tincture of opium to this prescription for an adult ; and, if the motions are foul-smelling, add 30 minims of liquor hydrargyri perchloridi to each dose for an adult. More benefit than from most other remedies is obtained from a firm binder, like a midwifery binder, tightly applied round the belly. Several layers of cotton wool should be placed underneath the binder, which requires adjustment morning and evening.

(6) *Tuberculosis of bones* is not uncommon in children. Fixed dull pain in a bone, increased at night, is generally the first sign, which is eventually followed by redness, swelling, and abscess, either in the bone itself, or in a neighbouring joint. The first symptom mentioned should lead to early application to a surgeon who is likely to have the part X-rayed. In the meantime the part should be kept at rest, and cold or hot applications (see Chapter XX) may be applied to the part, whichever is found to relieve the pain more.

(7) *Tuberculosis of joints* is a chronic inflammation of the joints due to the tubercle bacillus and occurring usually in older children. The affection is commoner in the hip and knee joints, and these will be described here separately.

(a) *Tuberculosis of the hip-joint* frequently arises without

any assignable exciting cause, but is often due to slight accidents. The earlier symptoms are trifling, and therefore often remain undetected, or unattended to. If, after a slight injury, a child complains of pain in the hip, or in the knee, if the child limps when tired, or if it drags one leg, a suspicion of incipient hip-joint disease should be aroused. The limb should be carefully measured, both when the child is standing up and when lying flat on the back. If one leg appears slightly longer than the other, the suspicion of hip-joint disease of the limb, thus apparently lengthened, is materially confirmed. For, in order to take the weight of the body off the affected joint, when the child stands he bears upon the sound limb, throws out the sound hip, and lowers that of the opposite side. In all such cases medical advice should be sought at once: the measurements and tests to determine the nature of any hip disease cannot be efficiently done by other than a medical man.

Treatment. The most important point is perfect and early rest of the affected limb. On suspicion of hip-disease the child should be kept on a hard bed; and if there is certainty of disease motion of the limb should be prevented by the use of a long, well-padded, splint. The bowels should be kept open. Cod-liver oil and malt extract are of benefit, and Prescription No. 73 may be given with advantage to a child. But the disease requires treatment by a skilled surgeon. Here it will suffice to mention the great importance of good hygienic conditions, rest, and good feeding.

(b) *Tuberculosis of the knee-joint* is not uncommon in children and young adults. It has sometimes been called white swelling, because, although the joint may be considerably enlarged, and the parts inside much diseased, the skin retains a white colour and gives little indication of the inflammation underneath. It is generally attributed to some injury, but the malady is constitutional, and the injury can only be regarded as the determining cause of the tubercle bacillus showing itself in a particular part of the body. The pain and enlargement are, at first, trifling, causing merely stiffness of the joint, and uneasiness only when moving or attempting to use it; so that the disease often makes considerable progress before it is recognised. A doctor should be consulted in any affection of the knee-joint and an X-ray photograph will often aid him in his diagnosis. There may be enlarged glands in the neck or some other manifestation of tubercle.

Afterwards the pain is greater, and generally worse at night. The malady, if not checked, usually terminates in abscess, and in disease of the bones of the joint. Stiffness, swelling, or tenderness of the knee, limping, occurring to children, should lead to application for medical advice. In the meantime it should be recollected that a diseased joint requires absolute rest, although fresh air should be afforded to the patient.

The reader will understand from the above how important this absolute rest on a splint is; and how very wrong would be any treatment that involved massage or free and forcible movements. Such movements would tend not only to make the joint worse, but to disperse the tubercle bacilli throughout the body. Herein lies the danger of consulting bone-setters and similar quacks, who are untrained to recognise the natures of the diseases that are brought before them. Their manipulations may do excellently for chronic rheumatic joints; they would be harmful for a tuberculous joint.

(8) *Tuberculosis of other parts* of the body may occur, such as of the kidneys and the eye. These conditions will not be described here, as only a skilled doctor could recognise them. It will be apparent that something is wrong with the urinary organs or the eye in either case, and the sufferer should consult a doctor.

Urine, Diseased conditions of. The quantity of urine passed by a healthy adult in twenty-four hours is from 30 to 40 ounces. But it varies with the amount of fluids consumed. Also it varies with the weather, being more copious in cold weather, when there is less perspiration from the skin. The quantity of urine is increased in diabetes, chronic Bright's disease also often in hysteria. It is scanty in most forms of acute inflammation of the kidneys and in most fevers. It is retained in stricture, sometimes in hysteria, and sometimes by infants. It is suppressed (*i.e.*, there is none secreted) in collapse and in cholera. It is passed more frequently when there is enlarged prostate, gravel, stone, irritable bladder, or inflammation of the bladder or kidneys. It is passed painfully in most maladies connected with the urinary organs, excepting diabetes and Bright's disease. An increased frequency in the number of times that urine has to be passed during the night is a common sign of disease associated with the urinary system. Normally a healthy adult does not have to rise and pass urine between going to bed and waking in the

morning, unless he has drunk an excessive amount of fluid on retiring for the night.

The colour of healthy urine is a pale straw or amber, and it should show but a very slight quantity of mucus, which appears as a filmy cloud. A heavy whitish deposit, clinging to the utensil when turned, indicates much mucus, which forms in chronic affections of the bladder. A yellowish-brown colour which may cause urine to assume a very dark tint is characteristic of bile and jaundice. If the urine is shaken up the froth assumes a yellow colour in this condition, while the froth of normal urine remains white.

A smoky hue denotes the presence of a small quantity of blood; a dark brown colour more blood; and a distinct red colour much blood. Blood in the urine (*hæmaturia*) may occur from a great number of causes. Such causes may be either local affections of the urinary organs themselves, as venereal ulceration of the urethra, stone, tumour in the kidneys or bladder; parasites, either hydatids in the kidney or the bilharzia *hæmatobia* in the bladder; or such causes may be general, as scurvy, the presence of a parasite in the blood, fevers, &c. In one fever blood in the urine occurs so frequently that one form has been specially designated black-water fever (see p. 44). Blood in the urine has been found in malaria fever, but it is not generally present. High-coloured urine attends most fevers, and may be difficult to distinguish from blood without the aid of a microscope. A milky appearance indicates the condition known as *chyluria*, due to a parasitic worm, *filaria*. 'Matter,' or pus, renders urine turbid, and it does not clear on boiling. The smell of urine is faint and peculiar. In diabetes there is a sweetish whey-like odour. In various chronic maladies of the urinary organs there is an ammoniacal smell in infection with *Bacillus Coli*, a common organism causing infection of the urinary tract, it has a fish like odour. Blood or bloody discharge causes a smell like that of faintly tainted meat.

The principal salts seen as deposits in the urine are given under Gravel, p. 180. Other but invisible, unnatural conditions, the presence of albumen and sugar, are mentioned on pp. 199 and 156. For proper investigation of urine, chemical and microscopical tests are essential and a description of these are outside the scope of this book.

Caution. On standing, healthy urine undergoes change. After a variable time according to the temperature, it becomes

cloudy, and emits a characteristic odour. This is not indicative of disease, but of decomposition.

Veins, Inflammation of the. This, technically termed phlebitis, may occur in any part of the body, but the limbs are most frequently affected. It may originate from injury, as a consequence of varicose veins, after childbirth, from a gouty tendency, or as a complication of enteric fever. When the veins become inflamed the blood usually clots in them. A clot is called a 'thrombus,' and the process of clotting is called 'thrombosis.' The danger of a thrombus is that part of it may become detached from the main clot and travel up the veins to the heart, whence it may lodge in the lungs or elsewhere, blocking the vessels and forming an 'embolus.' If a thrombus is infected, *i.e.*, contains pus-making micro-organisms, then the embolus that leaves it will be infected also, and the lodgment of such an embolus elsewhere may give rise to an abscess. This is the means of origin of the disease called pyæmia, the chief characteristic of which is the occurrence of abscesses in different parts of the body. Even if a thrombus is not infected the detachment of part of it as an embolus may be fatal from blocking of one of the pulmonary arteries.

In phlebitis the veins of the parts affected are hard, swollen, knobbed, painful, and tender. There is stiffness and difficulty of moving the part, and often swelling of the whole limb. There is also fever, and the temperature may be 100° F. or upwards. If the superficial veins are affected, they may be seen of a red or purple colour. In severe cases abscesses may form in the course of the veins, or absorption of putrid matter may take place, producing blood poisoning.

Treatment. From what has been said above, it will be understood that the most important thing in the treatment of phlebitis is absolute rest; especially in the early stages before the clot has hardened, when a piece of it may more easily become detached.

Further treatment must depend upon the cause of the particular case. The limb should lie horizontally and be wrapped in cottonwool. At first it should be moved only with the greatest care, if at all, even for purposes of washing. A period of six to eight weeks must elapse before a clot can be considered firm enough to warrant active movement of the limb; massage should then be undertaken gently.

Vomiting. Vomiting means the return of the contents of

the stomach and sometimes of the upper part of the intestine and is a symptom of disease, not a disease itself. The causes of vomiting may be in the (1) stomach itself; (2) brain; (3) some other organ, which acts reflexly upon the stomach or brain.

(1) When the cause is in the stomach, the affection may be chronic inflammation of that organ, which often gives rise to early-morning vomiting, such as is seen in chronic alcoholism. Or acute indigestion or other forms of dyspepsia may cause vomiting. Vomit sometimes mixed with blood may occur also with ulcer of the stomach or with cancer or from irritant poisons. In children vomiting occurs frequently from quite minor causes such as overeating or taking some indigestible substances.

(2) Brain vomiting is seen in the vomiting of infectious fevers, where the circulating poisons excite it, and in Bright's disease, or in diseases of the brain itself, such as tumour, and in meningitis, epilepsy, or emotion. Such vomiting occurs more easily in children.

(3) Irritation of other organs account for vomiting in sea-sickness, when the organs of equilibrium are disturbed; also much coughing, appendicitis, cholera, and diseases of the liver, or womb, especially in early pregnancy (see p. 466).

The colour, smell, and taste of vomited material are instructive and characteristic. Thus, in cholera the fluid vomited is copious, colourless with flakes of white material in it. Its chief characteristic is its quantity and its resemblance to the stools that are being passed at the same time. In hæmatemesis or bleeding from the stomach it may be black or bright red. When there is stoppage of the bowels, dark brown fluid with the smell of faecal matter is often vomited. True faeces are only vomited when there is a communication between the stomach and the large intestine. When bile is vomited, the taste is acid and bitter, and the colour yellowish. In some forms of dyspepsia, fluid, looking like water and tasting sour, is brought up.

As vomiting is only a symptom, the *treatment* must be devoted to removal of its exciting cause. Vomiting may even be beneficial, as for instance when it is directed to the removal of an irritant in the stomach, and in such cases the effort should be assisted either by washing the stomach out, or by administration of the emetic draught Prescription No. 30. Where the vomiting itself calls for relief Prescription No. 42

may be given in ounce doses, repeated after half an hour or sooner if vomited. To the first dose 10 minims of liquor morphinæ hydrochloratis may be added with advantage and repeated if vomited.

Worms. There are four common varieties of worms affecting the human intestine in India. Tape-worms and hook-worms occur mostly in adults : round-worms and thread-worms occur both in children and adults. The variety of worm present can be ascertained only by actual observation. In the case of tape-worms and thread-worms, naked-eye observation may show segments of the worm in the former case and complete worms in the latter. In the case of hook-worms, though a worm might be seen, yet it is unusual and diagnosis must usually be by the microscope, which will show the eggs of these worms in the feces. Round-worms are seen in the stools frequently and they may also be vomited. In the case of worms, the eggs can be seen in the feces on microscopical examination.

Tape-worm, of which there are several species, lives in either the large or small intestines, sometimes stretching throughout their whole extent. Its length is therefore sometimes very great, varying from six to twenty feet, or more. It is a flat, ribbon-like worm, of a white colour, from one-third to one-half of an inch broad at the widest part and composed of segments or pieces about half an inch long, each segment fitting into the preceding one, and a fully developed worm may number 1100 of these joints.

Each joint possesses a male and female organ, and each worm is therefore a chain of individuals. Towards the head the worm tapers very much and the segments are shorter. The head is triangular in shape, about the size of a pin's head, and is further known by four black spots, which are the suckers by which the worm clings to the bowels. The worm increases in length by fresh segments, developed at the neck, while the fully formed segments at the tail drop off, and pass away with the stools. The pieces thus expelled contain myriads of ova in which are embryos provided with a boring apparatus. On the extrusion of the joints putrefaction sets in, liberating the ova, which are carried by wind, water, or other agencies, wherever accident may determine. These ova may be taken into the stomachs of animals, such as pigs or oxen, with their food. When thus swallowed by an animal the egg breaks, and the embryo, by boring, lodges itself in the flesh, there

developing into a bladder-like substance or 'cyst,' and causing the affection known as 'pig measles.' The 'measle' when eaten with meat attaches itself to the human intestine, and there grows into the adult worm.

The principal cause of tape-worm is eating underdone infected pork or beef. The flesh of the Oriental pig is particularly dangerous in that respect; hence the hygienic rules of the Jews and Mussulmans. Complete cooking, however, will destroy any ovum.

The symptoms of tape-worm vary. There may be none. Sometimes there is a loss of weight, sometimes uneasiness or gnawing pain in the bowels, foul breath, or furred tongue. But the most striking thing is the passage of small, white, tapelike segments about half an inch long: there is no mistaking them.

Treatment. Tape-worm is treated by some specific remedy as mentioned below. The reason of success or failure of worm medicines depends much on the manner of taking them: if they reach the worm they kill or at least expel it; if not they fail. In the case of tape-worm it is particularly necessary that they should reach the head of the worm, for, although many yards of tape-worm may be voided, if the head remains it will grow again, and the old symptoms will return. But the head is exceedingly tenacious of its hold, and is protected by the thick mucus which the irritation of its presence causes the intestines to secrete. It is therefore necessary that preliminary steps should be taken before giving worm medicines. For two days the patient should be on an entirely milk diet: it will be better still if for the latter half of the second day only clear soup or beef tea is allowed. On the evening of the second day castor oil should be given in dose suitable to the age of the patient. Next morning early, after the castor oil has acted, the specific remedy is to be taken on an empty stomach. For a tape-worm the remedy is Prescription No. 31: an adult may take a dose and a half of the amount here prescribed. The patient must still fast for another three hours, and if at the end of that time the bowels have not acted again, i.e., since the worm medicine was taken, he is to take two ounces of Prescription No. 27. After that he may have a light breakfast. The worm will probably come away with the first motion after Prescription No. 31. The worm should be carefully washed and the head sought for. Sometimes there is more than one worm; and one may be entirely expelled

and one remain. If no head is seen, the patient should continue his usual life, watching carefully for reappearance of segments in the motion. They may reappear in a few weeks, in which case the treatment must be gone through again. If after two or three attempts with male fern (Prescription No. 31) the worm still reappears, some other remedy should be tried, for which purpose it is best to consult a doctor.

Round-worms may exist in any part of the intestines, and even in the stomach, from which they may be vomited or passed by the mouth. They may wander into the nose and frontal sinuses, or, invading the liver, may rarely cause jaundice. They are most common in children from three to ten years of age, who may be infested with one or many. In shape they resemble the common earth-worm, and are of a pale pink, or white colour, and semi-transparent. There is a circular depression behind the head, and the latter presents three small elevations, between which lies the mouth. In round worm infection there may be no symptoms, but in heavy infestation there may be irritability, restlessness, fever, and abdominal pain. Jaundice and serious abdominal symptoms are much rarer. The certain proof of the existence of round-worms is the sight of one passed with the stools, or the eggs seen by the microscopic examination of the fæcal matter.

Man is infected by swallowing a partly developed egg in his food or drink. Freshly passed eggs are not infective and it takes a few weeks for them to become so. The pig harbours round worms and is a source of infection.

When the egg hatches in the body the young larval worm passes into the blood stream from the intestine, through the lungs, up the wind pipe down the gullet and back to the intestine where it becomes mature.

In the *treatment* of round-worms the same preliminary dietetic and castor oil routine must be gone through as given above for tape-worms. The third morning the specific remedy to be taken is *santonin*, as contained in Prescription No. 80. The dose of the powder there given is sufficient for a child of four years. Take double that dose for a child of eight, and three times the dose for an adult. The worms can be easily seen if expelled: if there is any doubt as to whether all have come away, a microscopic examination of the fæces should be made to detect the presence or otherwise of ova. If *santonin* is unsuccessful, male fern may be used as recommended for tape-worm; but *santonin* should always be tried first. Other

and more powerful remedies are now known and may be tried by a doctor if *santonin* is not successful.

Thread-worms. Thread-worms are about one-third of an inch long, slightly bent, white and semi-transparent. They almost invariably infest the lower part of the bowels near the fundament, where they create much itching and irritation; but their headquarters, where they principally breed, is much higher, in or about the *cæcum*. They are not only passed with the *fæces*, but crawl out during the night on the clothes; they may also excite mucus, or bloody stools. In women they may crawl into the private parts, creating irritation and discharge.

Although most of the worms, including all the males, are in the *cæcum*, the pregnant females come down to the anus and outside it, to deposit their eggs, and it is this movement that creates such intense itching round the anus, especially at night. Often too there is an itching at the nose, and this itching at two places serves an important purpose so far as the worm's reproduction is concerned. The patient scratches the anus, often in his sleep, and later picks at his nose, or may rub his finger against his mouth. In this way the eggs are conveyed from the anus back to the stomach and so the life-history of the worm is maintained.

The *treatment* of thread-worm is easy so far as reduction of their numbers is concerned, but extremely difficult if total eradication is aimed at: since after a few months it will usually be found that they are still present. A diminution of the amount of starchy food, as bread, rice, and vegetables, in the diet will lessen the number of worms, since they flourish best apparently in an excess of such material. Measures should be taken to prevent reinfection from the anus: the child may sleep in closed drawers; or may have a little ointment, half mercury ointment, half vaseline, rubbed on the anus to prevent itching and kill the ova. The worms should be attacked both from above for those in the *cæcum*, and from below for those lower down. To attack from above, after the preliminary discipline of castor oil and diet given under tape-worm, administer *santonin* as advised under Round-worms (Prescription No. 80) and in the same doses. This aims at the younger worms. The older worms may be attacked in adult patients by injecting the lower gut daily with a tablespoonful of common salt in 8 ounces of water. Children should be given an enema containing teaspoonful of salt.

For an account of how to give an enema, see Chapter XX. The enema treatment should be continued daily for ten days.

Hook-worms. The scientific name of the hook-worm is the *anckylostoma duodenale*. This worm inhabits the duodenum and upper part of the small intestine.

Hook-worm disease is extremely common in India: in some parts of the country 100 per cent. of the natives are infected. Many Europeans also harbour the parasites. Although visible to the naked eye, the worm is too fine to be seen easily in the fæces unless special search is made. Diagnosis is usually made after microscopical examination of the fæces has discovered the eggs of the worm. Infection usually takes place through the feet and the young larval worm is to be found in the soil around latrines and any damp place where defæcation has occurred. Bathing in rivers or going about on damp soil without shoes is therefore dangerous. The symptom of hook-worm disease is anæmia.

The diagnosis and treatment of this condition must be left to a medical man, as the drugs used are all powerful poisons.

POISONING

THE instructions here given for action in a case of suspected poisoning are of the tersest, because reference to this chapter is likely to be made only in emergency, when time is all valuable and the presence of too many directions may confuse more than it helps. Only in the case of snake-bite are the directions more explicit ; because, snake-bite being a common fear in some parts, that section is likely to be read before necessity for its use arises. If further instruction is required on details of the treatment recommended in the case of some poisons, it can be found by reference to other parts of the book : thus ' Artificial Respiration ' will be found described on p. 324 and the method of washing out the stomach on p. 601.

POISONS AND THEIR TREATMENT

Scorpion-sting. The pain is at first like a prick from a needle, but in a few seconds it assumes an agonising form, as if many needles were being thrust into the part, and it also shoots up towards the body, reaching a climax in about ten minutes. The parts injured swell ; frequently the absorbent vessels (*lymph vessels*) running from the sting are implicated as evidenced by a red line seen in the skin ; and the joint above the part feels stiff. Death from scorpion-sting has been recorded, but to a person in good health such injuries are not dangerous. The best treatment is the application of strong ammonia to the part ; and then cold applications such as crushed ice or evaporating lotion (*see* p. 570) for the rest of the day. Next day hot fomentations should be applied, and 1 ounce of Prescription No. 27 taken.

Snake-Bite. Snakes inject their poison through punctures made by two prominent upper teeth, the fangs : the tongue of the snake, which so many people seem to think poisonous, is harmless. The bites of poisonous snakes, as a rule, show two marks thus, . . . When there are more than two marks . . . it may generally be assumed that the reptile was not poisonous, or that the wound has not been inflicted by

the poison-fangs. The parts most frequently bitten are the fingers, toes, ankles, and hands, and the person, if asleep, is aroused by the pain, which is of a stinging character, but not very severe at first. Thereafter the symptoms are somewhat different according to the kind of snake. There are two principal families, the *Colubrine*, of which the best-known example is the cobra, and the *Viperine*, of which a good example is the Daboia or Russell's viper. The action of colubrine poison is chiefly on the nervous system, causing paralysis and being fatal by its paralytic action on the breathing centre; to a less degree colubrine poison acts on the blood. The action of viperine poison is chiefly on the blood, which it prevents clotting; to a less extent it acts on the nervous system. The existence of this difference is the reason for making antivenene out of a mixture of both kinds of poison, so that whatever snake makes the bite the antivenene will have some action against its poison. In the case of the cobra or other colubrine bite, after the initial pain at the seat of the bite, faintness, sickness, loss of power in the legs, drowsiness, and perhaps vomiting are the next immediate effects. Then the breathing becomes short and laboured, the pulse quick and intermittent, the powers of speech and swallowing are lost, the tongue protrudes, and frothy saliva issues from the mouth. Twitchings of the muscles also occur, followed by loss of power to move the limbs. The pain from the wound extends upwards towards the body; the absorbent vessels become inflamed, appearing on a fair skin as painful red lines stretching up from the wounded part towards the groin or armpit. Cold sweats and often convulsions succeed, and the patient, becoming insensible, sinks, sometimes in a few hours. More commonly, however, the case is prolonged several days, blood-poisoning occurring. The wound becomes discoloured, the limb swells, blisters may form near the injured part, abscesses may occur in any part of the limb, and the glands of the armpit or groin (according to the limb injured) enlarge, inflame, and suppurate. Sometimes there is diarrhoea, at other times bleeding from the snake-bite, or from scarifications made in the neighbourhood. In some cases there is also bloody urine, or bleeding from the nose, bowels, or gums. The depressing effects of fear will aid the operation of the poison; and the symptoms will be more or less intense, according to the amount of venom inserted into the wound.

In the case of viperine bite, though the nervous symptoms are, as a rule, less marked than in the colubrine, convulsions are often present early in the case. The principal action is on the blood, however, and the effect here depends partly on the dose of poison injected. If that has been large then death may be very rapid, and is then due to abnormal clotting of the blood in the vessels; especially in the large pulmonary arteries. If the patient survives this stage there ensues later a condition where the blood has lost its power of coagulation, and so the wound at the bite may ooze blood continuously, hæmorrhage may start from mucous membranes and elsewhere and nothing may be able to stop the patient bleeding to death.

One of the first things to do after snake-bite is to secure the snake: it is important that the species be identified, above all to ascertain whether it be a poisonous snake or not.

Treatment. The *immediate* thing to do if the bite is from a poisonous snake is to ligature the part above the bite. If the bite is anywhere on the limbs, tie a tight bandage or string round the limb, a few inches *above* the wound, but never on the fore-arm or below the knee, as there are two bones in these parts and the blood vessels run between them. The ligature should be tight enough to arrest the circulation, which may be known by the part below becoming red, and then darker coloured. Then let the wound be *well* incised and solid permanganate crystals placed directly into the wound. A solution of potassium permanganate in water should also be made, and about 2 grains of the permanganate in solution injected into two or three spots round the wound by means of a hypodermic syringe or else by the antivenene syringe which should also be at hand. If there is no potassium permanganate at hand at the time, a substitute for it is chloride of gold, which may sometimes be found in the equipment of photographers: it should be used similarly to the permanganate. If there is nothing available for this local treatment the wound should be well sucked; care being taken that the person performing this office has no sore on the mouth or lips; or, if a ligature cannot be applied (as, for instance, if the body is bitten), let the wound be sucked first. For neutralisation of the poison in the body antivenene should be used as early as possible; an account of what antivenene is and how to use it is given below. Antivenene should

always be in stock in snake-infested districts, while those leading a life that takes them much into the jungle should carry on them one of the small potassium permanganate and lance equipments sold for the purpose of dealing with snake-bites. To sum up the treatment:

- (1) Act as promptly as possible.
- (2) Ligature the part above the bite, avoiding the forearm and the parts below the knee.
- (3) Incise the wound, and rub into it solid potassium permanganate crystals.
- (4) Inject potassium permanganate solution into tissues round wound.
- (5) Inject antivenene.

Antivenene and how to Use It. Antivenene is the serum of horses highly immunised with cobra and Russell's viper venom.

Its curative properties have been tested on animals against these venoms and found effective.

In a case of cobra or Russell's viper bite, when the patient is seen early and before symptoms have set in, 30-40 ccm. should be injected subcutaneously into any part of the body where the skin is loose (preferably in the flanks). When the snake is a large one it would be advisable to give more.

Children and small persons require a larger dose of antivenene to save them than well-grown adults.

The syringe and needle should also be made sterile before use. For practical purposes filling and refilling a few times with boiling water, is quite sufficient. Time being a most important item, it is not advisable to waste it. The skin over the seat of inoculation should be washed with an antiseptic lotion beforehand if such is quickly available.

TO OPEN THE BOTTLE. Heat the narrow neck in a flame, rotating the bottle at the same time so as to heat the glass all round. Then jerk up some of the fluid contents. The cool liquid coming in contact with the heated glass will crack the latter, when the top may be knocked off by a gentle tap with a sterilised forceps or other metal instrument. To withdraw the contents, turn the newly opened bottle boldly upside down; the hole in the neck being so small the fluid will not run out. Insert the needle of the syringe. Withdraw the piston of the syringe and the fluid will enter in the ordinary way.

The bottles should be kept in a cupboard or press in the

coolest room available and should not be exposed to the light.

Heat and light are the most important factors in bringing about a deterioration in the strength of the antitoxic properties of the serum.

When kept in the dark and in a fairly cool place the serum loses very little of its antitoxic properties in a year—probably not more than 5 to 10 per cent., if as much. An increase of dose would make up for this loss.

With the exception of applying a ligature above the seat of the bite (where this is possible) and adopting the permanganate of potash treatment, no other form of local treatment does much good.

It is also a mistake to dose the patient with alcohol, ammonia, or strychnine. Hot coffee or tea cannot possibly do any harm, and may do some good.

A ligature applied early above the seat of bite produces œdema, and in this way prevents the absorption of some of the poison, or at least delays it from entering the general circulation. More time may thus be gained for the administration of antivenene before symptoms of poisoning have already set in.

The above instructions are those given by the Central Research Institute at Kasauli; from whom as well as from the Bombay Bacteriological Laboratory antivenene may be purchased.

IN CASES OF POISONING PROCEED AS FOLLOWS :*

If possible identify the poison and turn to alphabetical list :

1. Ask patient, if conscious, or the bystanders.
2. Look at and smell the bottle or container.
3. Look at patient's *Lips, Tongue, Mouth, Gullet* for white, red, yellow or black patches, indicating burning. If present feel them, if SOAPY to the touch, poison is a STRONG ALKALI. Taste by touching one of the patches with the tip of the finger. ACID taste will be immediately perceptible. PROCEED as for STRONG ACIDS or ALKALIES. Do not use emetics or stomach pump.

4. Smell breath, Poisons with distinct smells :
(a) Ammonia.

* I am indebted to 'Medical Emergencies' by Newnan, published by J. A. Churchill for the general arrangement of this scheme. R. D. A.

- (b) Carbolio acid, Lysol and other similar disinfectants.
- (c) Strong Hydrochloric and Nitric acids.
- (d) Cyanides and Prussic acid (Bitter almonds).
- (e) Alcohol, Chloroform, Ether, Benzol, Paraffin.
- (f) Opium if dose is large.

If not identified and there is no evidence of burning proceed as follows :

1. Wash out the stomach, by passing about 18 inches of soft rubber tubing into the stomach and pour in about half a pint (one tumblerful) of warm water, lower the tube and the fluid will syphon out, repeat several times and at this point give any of the substances recommended in the case of a known poison.
- } Keep the washings.

If stomach wash cannot be carried out :

2. Give one of the following emetics :

- (a) Tepid dish water if available until the patient vomits.
 - (b) A tablespoon of mustard or salt in a tumbler of warm water. Repeat if necessary.
 - (c) Half a small teaspoonful of copper sulphate (blue Vitriol) in a tumblerful of warm water.
 - (d) Half a small teaspoonful of Sulphate of Zinc in a tumblerful of warm water.
 - (e) Tickle the throat in combination with the above or alone.
- } Keep vomit.

3. Get an assistant A to boil a handful of tea in a small kettle of water. B to beat up an egg in a glass of cold milk.

4. After stomach has been emptied give milk and egg and follow it up with the tea diluted with cold water until sufficiently cold to drink.

5. Artificial respiration if necessary (p. 324).

6. If collapsed (cold, pale) give a tablespoonful of brandy or whisky, diluted with a little water.

Salvolatile if available may be given in 2 teaspoonful doses in a little water ; repeated after half an hour. Hot water and blankets. The foot of the bed to be raised 6 inches.

Bandage the limbs in cotton wool from below upwards.

NAME OF POISON	SYMPTOMS	TREATMENT
Aconite. Vernacular : mithazahar, bish.	Numbness and tingling of the tongue and lips, burning of the throat, spitting, hawking, frothing at the mouth, vomiting, pupils dilated, but contracting on exposure to strong light, delirium, stupor, paralysis, insensibility, convulsions.	<i>Immediate.</i> Stomach-tube or emetic ; hypodermic injection of digitalin, gr. 1 100. <i>Later.</i> Brandy, warmth, friction ; artificial respiration.
Alcohol. Vernacular : Sharab.	Face flushed, pupils dilated, confusion of thought, bounding pulse, vacant expression, coma ; often vomiting. As for Hydrocyanic Acid.	<i>Immediate.</i> Stomach-tube or emetic ; cold to head. <i>Later.</i> Hot strong coffee, warmth, artificial respiration. As for Hydrocyanic Acid.
Almonds, Essential Oil of Bitter. Ammonia. Antifebrin.	As for Caustic Potash. As for Antipyrine.	As for Caustic Potash. As for Antipyrine.
Antimony, Salts of. Such as tartar emetic.	Burning heat, choking in throat, nausea, incessant vomiting and purging, pain in belly, cramps, collapse.	<i>Immediate.</i> Encourage vomiting by draughts of warm water. Give emetic if no vomiting ; tannic acid, 1 dr. ; strong tea or coffee in unlimited quantities. <i>Later.</i> Demulcents ; brandy, opium, warmth.

NAME OF POISON	SYMPTOMS	TREATMENT
Antipyrine.	Vomiting, face blue, profuse sweat, collapse; sometimes a rash.	Warmth, digitalin, $\frac{1}{100}$ gr., hypodermically; brandy; artificial respiration; recumbent position. Give a teaspoonful of Sodium Bicarbonate two hourly.
Arsenic and its Salts. Vernacular: Sunkiah, sumbul.	As for Antimony.	<p><i>Immediate.</i> Stomach-tube or emetic, followed by a mixture of oil and lime-water, soap and milk, flour-and-water, powdered charcoal in water, or Wyeth's dialysed iron in large quantity, 2 or 3 oz. followed by very weak rust scraped off iron. <i>Ferric hydrate</i>, which must be fresh and can be prepared as follows: <i>Tincture of perchloride of iron</i> oz. $\frac{1}{4}$, water oz. 4; to which add <i>carbonate of soda</i> (washing soda) <i>saturated solution in water</i> oz. 1. This dose should act as an antidote to 3 gr. of arsenic, and may be repeated as necessary.</p> <p><i>Later.</i> D. mucilents, brandy, opium; hot fomentations to belly.</p>

Atropinè.	Throat and skin dry, skin flushed, no urine passed, pulse quick, pupils dilated, delirium, often purging and raised temperature, headache, faintness, dimness of sight, giddiness, thirst, excitement, voluble talking, laughter, fatuity, insensibility, stertorous breathing, frothing at the mouth.	<i>Immediate.</i> Stomach-tube or emetic ; hypodermic injection of pilocarpine nitrate, $\frac{1}{4}$ gr. ; hypodermic injection of morphine sulphate, $\frac{1}{2}$ gr. <i>Later.</i> Brandy, hot coffee, warmth ; artificial respiration. The patient may require control.
Belladonna. Nightshade berries.	As for Atropine.	As for Atropine.
Benzol.	Delirium, contracted pupils, coma, great weakness, difficulty of breathing.	<i>Immediate.</i> Stomach-tube or emetic. <i>Later.</i> Brandy, inhalation of ammonia.
Bichromate of Potash.	Vomiting, dilated pupils, cramps, insensibility.	<i>Immediate.</i> Stomach-tube ; chalk in milk. <i>Later.</i> Demulcents, olive oil, warmth ; opium and stimulants if necessary.
Calabar Bean.	Vomiting, muscular tremors, slow pulse, contracted pupils.	<i>Immediate.</i> Stomach-tube or emetic. <i>Later.</i> Hypodermic injection of Atropine Sulphate, gr. $\frac{1}{100}$, or tincture of belladonna, 20 minims, by mouth ; brandy, sal volatile.
Camphor.	Excitement, dilated pupils, delirium, convulsions.	<i>Immediate.</i> Stomach-tube or emetic. <i>Later.</i> Inhalation of sal volatile ; subcutaneous injection of brandy ; warmth.
Cannabis Indica. Vernacular : gunja, bhang, hashish.	Appears like a drunken person, fits of laughing, alternating with intervals of stupidity, which gradually increase to insensibility. At times violent mania.	Stomach-pump or emetic ; treat symptoms as they arise.

NAME OF POISON	SYMPTOMS	TREATMENT
Cantharides. Blistering fluid : Spanish fly.	Burning pain in throat and stomach, vomiting and diarrhoea. Incessant desire to pass water. Headache, quick pulse, convulsions.	<ol style="list-style-type: none"> 1. (a) If patient is seen shortly after poison is swallowed and mucous membranes are not yet blistered, use stomach-tube ; (b) if throat blistered, produce emesis with apomorphine hydrochloride (hypodermic), $\frac{1}{10}$ gr. 2. (a) White of egg in water or barley-water, or (b) thick gruel. 3. Stimulants. 4. Relieve pain with morphine sulphate (hypodermic), $\frac{1}{2}$ gr. 5. Avoid oils and fats.
Carbolic Acid. Phenol.	<p>(a) Pain in mouth, throat and belly. Intense thirst, vomiting of altered blood, brown or black, and of mucus. Profound collapse, skin pale ; cold and clammy ; eyes sunk and wild-looking ; temperature subnormal, respiration laboured.</p> <p>(b) Lips and mouth white and hardened, urine greenish.</p> <p>N.B.—If taken <i>dilute</i> in any quantity there is no corrosion, but coma supervenes.</p>	<p>No emetic ; but, if a soft rubber tube can be carefully introduced into the stomach, wash it out with solution ($\frac{1}{2}$ oz. to a pint of water) of sulphate of magnesia (Epsom salts) or sulphate of soda. Failing this, let these solutions be swallowed : olive oil, milk, white of egg freely given will act well after the poison, if just swallowed, is removed from the stomach. Where there is failing of heart and weak respiration, hypodermic injections of strychnine—hot saline solution by the rectum—artificial respiration ; brandy.</p>

Caustic Potash.	As under (a) for Carbolic Acid. Also purging, weak and rapid pulse.	<i>Immediate.</i> Do <i>not</i> use stomach-tube or emetic; give freely vinegar and water, lemon juice, orange juice. <i>Later.</i> Demulcents, olive oil, warmth, opium; brandy subcutaneously.
Caustic Soda.	As for Caustic Potash.	As for Caustic Potash.
Chloral.	Skin cold, temperature subnormal, pulse and respiration slow, deep coma.	<i>Immediate.</i> Stomach-tube and emetic; hot blankets, hot bottle to feet. <i>Later.</i> Hot strong coffee or tea, artificial respiration, hypodermic injection of strychnine hydrochloride, gr. $\frac{1}{32}$.
Chlorodyne.	As for Opium.	As for Opium.
Chloroform. Inhaled.	Respiration ceases, pupils dilate, pulse ceases.	<i>Immediate.</i> Clear the throat, pull forward the tongue, place head lower than the body; fresh air; artificial respiration; inhalation of nitrite of amyl; hypodermic injection of strychnine hydrochloride, gr. $\frac{1}{32}$, and of adrenalin hydrochloride, 1 in 1,000, 10 min.
Chloroform. Swallowed.	As for Alcohol.	<i>Immediate.</i> Emetic and stomach-tube; cold water to face; nitrite of amyl inhalation; artificial respiration.

NAME OF POISON	SYMPTOMS	TREATMENT
Cocaine.	Pale, dry skin, giddiness, fainting, quick pulse; tremors and convulsions sometimes.	<i>Immediate.</i> Stomach-tube, brandy; inhalation of amyl nitrite, or of ammonia; hypodermic injection of ether; artificial respiration. <i>Later.</i> Potassium bromide, 30 grs., repeated after two hours.
Colchicum.	Griping in belly, vomiting, purging, sometimes blood-stained matter; features pinched, pulse weak; may be delirious.	<i>Immediate.</i> Stomach-tube or emetic. <i>Later.</i> Demulcents, stimulants, strong tea, tannic acid, warmth; artificial respiration.
Conium. Henlock.	Weakness of limbs, difficulty of breathing, pupils dilated, loss of sight, consciousness retained.	<i>Immediate.</i> Stomach-tube or emetic; strychnine hydrochloride, gr. $\frac{1}{32}$, hypodermically. <i>Later.</i> Strong tea, warmth, brandy; artificial respiration if necessary.
Copper, Salts of. Verdigris, blue vitriol.	Vomiting bluish or greenish, griping, salivation, rapid pulse, delirium and convulsions, coma.	<i>Immediate.</i> White of egg and warm water; stomach-tube or emetic if vomiting has not occurred. <i>Later.</i> Demulcents, morphine or tincture of opium and hot fomentations if much pain.
Corrosive Sublimate.	As for Mercury, Salts of.	As for Mercury, Salts of,
Croton Oil.	As for Colchicum,	As for Colchicum,

Cyanide of Potassium.	As for Hydrocyanic Acid.	As for Hydrocyanic Acid.
Datura.	As for Atropine.	As for Atropine.
Deadly Nightshade.	As for Atropine.	As for Atropine.
Digitalis.	Pain in belly, vomiting and purging, headache, delirium, convulsions, coma; pulse slow and irregular, pupils dilated.	<i>Immediate.</i> Stomach-tube or emetic. <i>Later.</i> Strong tea or coffee in abundance, brandy, warmth, recumbent position for long time; an aperient.
Emerald Green.	As for Arsenic.	As for Arsenic.
Elaterium.	As for Colchicum.	As for Colchicum.
Ergot.	Vomiting, giddiness, disturbances of vision, loss of sensation in hands and feet, spasms, convulsions.	<i>Immediate.</i> Stomach-tube or emetic; amyl nitrite inhalation. <i>Later.</i> Brandy, sal volatile, strong tea, aperient.
Eserine.	As for Calabar Bean.	As for Calabar Bean.
Ether (inhaled).	As for Chloroform (inhaled).	As for Chloroform (inhaled).
Fungi, Poisonous.	Thirst, griping, vomiting, purging, excitement, followed by com a slow pulse, stertorous respiration, pupils dilated.	<i>Immediate.</i> Emetic or stomach-tube; tincture of belladonna, 15 min., by mouth, sal volatile. Hypodermic injection of atropin, gr. $\frac{1}{50}$, instead of belladonna if available. <i>Later.</i> Stimulants, aperient.

NAME OF POISON	SYMPTOMS	TREATMENT
Gases, Poisonous. Acetylene, carbon dioxide, carbon monoxide, coal gas, marsh gas.	Giddiness and ringing in ears, loss of muscular power, pupils dilated, violent action of heart and breathing, convulsions, coma, or asphyxia. Cherry red colour in carbon monoxide poisoning.	Fresh air, artificial respiration, ammonia to nostrils, warmth and stimulants, cold douche to head and chest.
Herbane (Hyoscyamus).	As for Atropine.	As for Atropine.
Hydrochloric Acid. Spirits of Salt.	Pain in mouth, throat and belly; intense thirst, vomiting of altered blood, brown or black, with rancous and shreds; profound collapse, skin pale, cold, clammy; face blue, eyes sunk, pulse fast and weak, breathing laboured, temperature subnormal.	<i>Immediate.</i> Do not give stomach-tube or emetic; give soap and water, chalk, magnesia, carbonate of soda with plenty of water. <i>Later.</i> Demulcents, olive oil, white of egg, morphine, $\frac{1}{2}$ gr., hypodermically.
Hydrocyanic Acid. Prussic Acid.	Symptoms come at once: giddiness, loss of power, insensibility, panting breath, may be convulsions, profound collapse, skin cold, clammy, eyes fixed, pupils dilated, pulse imperceptible, breath may smell of bitter almonds.	<i>Immediate.</i> This poison is very rapid: dash cold water over head and chest, give emetic or promote vomiting by tickling back of throat, inhalation of ammonia, brandy, artificial respiration, hydrogen peroxide.
Iodine.	Pain in throat and stomach, yellow vomiting, purging, thirst, giddiness, faintness.	<i>Immediate.</i> Emetic and stomach-tube. <i>Later.</i> Starch and water, demulcents, morphine sulphate, $\frac{1}{2}$ gr., hypodermically.

Iodoform.	Giddiness, vomiting, rapid pulse, dilated pupils, drowsiness, hallucinations, delirium.	Starch and water, demulcents, warm baths, sodium bicarbonate.
Lead, Salts of.	Metallic taste, dry throat, intense thirst, gripping pain, may be vomiting, giddiness, convulsions, coma.	<i>Immediate.</i> Stomach-tube or emetic; dilute sulphuric acid, $\frac{1}{4}$ oz. in water; magnesium sulphate, $\frac{1}{4}$ oz. in water. <i>Later.</i> Demulcents, white of egg, aperients, stimulants.
Mercury and its Salts. Corrosive sublimite, white precipitate, red precipitate, vermillion.	Metallic taste, pain in stomach, vomiting and purging of mucus and blood, skin cold and clammy, pulse feeble and fast.	<i>Immediate.</i> First give white of egg, and milk or water; then stomach-tube or emetic. <i>Later.</i> Demulcents, stimulants, tincture of opium, 20 min. in water.
Nicotine. Tobacco, weed killer.	Depression, giddiness, nausea, vomiting, cold clammy sweat, loss of consciousness, sighing breathing, coma.	<i>Immediate.</i> Stomach-tube or emetic; stimulants, warmth, artificial respiration; strychnine hypodermically, gr. $\frac{1}{32}$. <i>Later.</i> Stimulants.
Nitrate of Silver.	Pain in throat and stomach, vomiting of white matter, turning black on exposure to light.	<i>Immediate.</i> Two tablespoons of common salt in milk or water; repeat if necessary, then give emetic. <i>Later.</i> Demulcents, tincture of opium, 20 min.
Nitric Acid.	As for Hydrochloric Acid.	As for Hydrochloric acid.

NAME OF POISON	SYMPTOMS	TREATMENT
Nitroglycerine.	Violent headache, sleep; sometimes vomiting and purging.	<p><i>Immediate.</i> Recumbent posture, cold affusion.</p> <p><i>Later.</i> Hypodermic injection of liquor atropinæ sulphatis, 2 min., or atropin, gr. $\frac{1}{100}$.</p>
<p><i>Opium.</i> Battley's solution, chlorodyne, codeine, dionin, Dover's powder, heroin, laudanum, morphine, nopenal, paracoric. Vornacular : afeen, amal.</p>	<p>Preliminary stage of mental excitement, followed by giddiness, drowsiness, stupor, succeeded by total insensibility and stertorous breathing, skin cold, face pallid, eyes closed, pupils contracted; sometimes smell of opium about breath.</p>	<p><i>Immediate.</i> Stomach-tube or emetic; wash out stomach at half-hour intervals with solution of potassium permanganate, about 10 gr. to a tumbler of water; dash cold water on face; ammonia or nitrite of amyl to nostrils.</p> <p><i>Later.</i> Hot strong coffee, strychnine hydrochloride, gr. $\frac{1}{32}$, hypodermically, artificial respiration if necessary.</p>
<p><i>Oxalic Acid.</i> Salts of Lemon.</p>	As for Hydrochloric Acid.	<p><i>Immediate.</i> Do not give stomach-tube or emetic; give chalk or whiting, magnesia and water, a pint of lime water, milk with one teaspoonful of sugar or preferably glucose.</p>
<p><i>Paraffin.</i> Petroleum, petrol.</p>	<p>Burning pain in mouth and stomach, vomiting, matter has odour of paraffin, thirst and restlessness, breath smells of oil, body cold, face pale, pulse feeble, respiration sighing; may be coma.</p>	<p><i>Later.</i> Brandy, castor oil.</p> <p><i>Immediate.</i> Stomach-tube or emetic; hypodermic injection of strychnine.</p> <p><i>Later.</i> Stimulants, warmth.</p>

Phenacetin.
Phosphorus.
Rat paste, matches.

As for Antipyrine.

Few hours after taking; burning pain, thirst, vomiting of blood and material that is phosphorescent in the dark. If death does not occur now, after 2 or 3 days' interval there ensues jaundice, enlargement of liver, great prostration, cold sweat, twitchings, coma.

Picrotoxin.

Vomiting, purging, dimness of vision, convulsions.

Pilocarpine.

As for Calabar Bean.

Potash Caustic.

See Caustic Potash.

Ptomaines.

See p. 111.

Rat paste.

As for Phosphorus or Arsenic.

Resorcin.

As for Antipyrine.

See Oxalic Acid.

As for Antipyrine.

Immediate. Stomach-tube or emetic; a good emetic is copper sulphate, 3 gr. dissolved in 4 oz of water, every five minutes till vomiting induced; then every fifteen to thirty minutes an antidote. *French* oil of turpentine or sanitas, $\frac{1}{2}$ oz. in mucilage every hour; magnesium sulphate, $\frac{1}{4}$ oz. *Later.* Avoid oils and fats, opium. Give Calcium (Kalkzanna) Glucose in large amounts.

Immediate. Emetic or stomach-tube; chloral.

Later. Potassium bromide; chloral.

As for Calabar Bean.

See Caustic Potash.

See p. 111.

As for Phosphorus or Arsenic.

As for Antipyrine.

See Oxalic Acid.

NAME OF POISON	SYMPTOMS	TREATMENT
Santonin.	Vomiting, diarrhoea, dilated pupils, yellow vision, convulsions.	<i>Immediate.</i> Stomach-tubo or emetic; stimulants; if convulsions, chloral and potassium bromide. <i>Later.</i> Stimulants.
Savin.	Vomiting, diarrhoea, bloody urine, suppression of urine.	<i>Immediate.</i> Emetic. <i>Later.</i> Demulcents, castor oil, opium.
Scorpion.	See p. 245.	See p. 245.
Silver, Salts of.	As for Nitrate of Silver.	As for Nitrate of Silver.
Snake.	See p. 245.	See p. 245.
Soda, Caustic.	See Caustic Soda.	See Caustic Soda.
Sorrel, Salts of.	As for Oxalic Acid.	As for Oxalic Acid.
Stramonium.	As for Atropine.	As for Atropine.
Stychnine. Nux vomica, vermin killer, brucine.	Feeling of suffocation, convulsions with short intermissions causing sweating and exhaustion, distention of face, staring eyeballs, fixed chest, arched back, consciousness retained.	<i>Immediate.</i> Wash out stomach at half-hour intervals with potassium permanganate in warm water; emetic and stomach-tubo; apomorphine hypodermically, potassium bromide, 1 drachm in water every half hour, inhalation of chloroform to control convulsions. <i>Later.</i> Inhalation of chloroform if convulsions are severe; artificial respiration.

Sulphonal.	Pain in stomach, vomiting, confusion of mind, partial paralysis, suppression of urine, profound collapse, unconsciousness.	<i>Immediate.</i> Stomach-tube or emetic ; stimulants, strychnine hypodermically. <i>Later.</i> Warmth, artificial respiration, recumbency.
Sulphuric Acid.	As for Hydrochloric Acid.	As for Hydrochloric Acid.
Tartar Emetic.	See Antimony, Salts of.	See Antimony, Salts of.
Tin, Salts of.	Vomiting and purging.	<i>Immediate.</i> Emetic and stomach-tube ; milk or white of egg. <i>Later.</i> Demulcents.
Trional.	As for Sulphonal.	As for Sulphonal.
Turpentine.	Smell of turpentine in breath, noisy breathing, contracted pupils, convulsions, coma ; urine smells like violets.	<i>Immediate.</i> Emetic or stomach-tube ; demulcents. <i>Later.</i> Magnesium sulphate, 1 oz. in water ; opium.
Veronal.	As for Sulphonal.	As for Sulphonal.
Zinc, Salts of.	Pain in throat and stomach, lips and mouth corroded ; blood-stained vomit, rapid pulse, convulsions, coma.	<i>Immediate.</i> Do <i>not</i> use stomach-tube or emetic ; large draughts of white of egg and milk, carbonate of sodium or potassium in large quantities in warm water. <i>Later.</i> Demulcents, strong tea, warm fomentations, tincture of opium.

CHAPTER VIII

ACCIDENTS AND SURGICAL EMERGENCIES

Introduction : Instruments and Appliances : Asepsis and Antisepsis : Dressing a wound : Anatomy : Hemorrhage : Natural arrest : Types of hemorrhage—Arterial, Capillary, Venous : Symptoms : Treatment : First Aid : The Skin—Injuries : Blisters : Wounds and cuts : Foreign bodies : Animal bites : Ulcers : Stings : The Joints—Sprains : Dislocations—Shoulder : Jaw : Clavicle : Hip : Semilunar cartilages of knee : Fractures—Types : General Symptoms and Signs : Lines of treatment : Lower Jaw : Nose : Collar bone (Clavicle) : Arm bone (Humerus)—Upper end : middle : lower end : Prominence of back of elbow (Olecranon) : Bones of the forearm (Ulna and Radius) : Colles' Fracture (i.e., the main bone of the forearm above the wrist) : Bones of the hand and fingers (Metacarpals and Phalanges) : Ribs : Pelvis : Thigh bone (Femur) : upper end : middle : lower end : Knee cap (Patella) : Bones of the leg (Tibia and Fibula) : middle : lower ends : Bones of the foot (Tarsal and metatarsal bones) : The Skull : Concussion : The Spine : Wounds of the Scalp : The Throat : The Tongue : The Chest : The Abdomen : The Genitals : Frost bite : Burns and Scalds : Lightning : Drowning.

THE ultimate object of all treatment, surgical or medical, is to restore the patient to normal health. Therefore treatment should be so planned that at best it will lead to cure and at worst it can do no harm. Even the simplest surgical operations in the hands of the inexperienced are fraught with the possibility of danger to the patient, and should never be lightly undertaken. In the following chapter a description will be given of the measures any one may be called upon to take in the occasional care of a surgical case, pending the arrival of the doctor in a few hours. For the benefit of those whose work takes them to places where skilled medical assistance cannot be obtained within 3 or 4 days or more, description of methods of treatment of such conditions as fractures, and retention of urine, has been amplified to give some ideas beyond mere First Aid. But such wanderers in strange places are strongly advised to supplement their theoretical knowledge of surgical methods by receiving

a few practical demonstrations prior to leaving civilization behind them.

Instruments and Appliances. For surgical purposes the following instruments and appliances are recommended :

- (1) Absorbent cotton wool for use as dressings and swabs to clean wounds.
- (2) Lint for dressings.
- (3) Bandages, roller and triangular. Plaster of Paris bandages are most useful to make splints for fractured bones, but considerable experience is required for their proper application.
- (4) Adhesive plaster for keeping dressings, splints, &c., in place.
- (5) The following antiseptic lotions are recommended as most generally useful. Their application will be discussed later :
 - (a) Rectified spirit.
 - (b) Tincture of Iodine.
 - (c) Potassium Permanganate crystals.
 - (d) Lysol.
- (6) Talcum powder.
- (7) Enamel bowls and kidney trays for holding sterile dressings, instruments, &c.
- (8) Dressing forceps. Artery forceps. Tooth extraction forceps.
- (9) Probe. This is used for probing a wound to ascertain its depth, direction, and the presence of a foreign body such as a button.
- (10) Two pairs of scissors, one surgical, the other of the domestic variety. The latter should be used for cutting dressings, &c. and the surgical scissors should be kept for cutting ligatures, snipping tags of tissue and other surgical uses.
- (11) Two scalpels, one medium size and the other small. These should be used for no purpose other than surgical, for example opening an abscess. The scalpels are very sharp and quickly lose their edge and temper if used indiscriminately.
- (12) A spool of linen thread. This can be used for stitching skin and tying blood vessels. Pieces can be easily sterilised by boiling when required.
- (13) Straight and curved cutting needles of assorted sizes for stitching skin.

- (14) Three rubber catheters, small, medium and large. These can be used in cases of retention of urine without danger to the patient. Special knowledge and skill is required to pass a metal catheter.
- (15) Gutter splints of assorted sizes for fractures.
- (16) A primus stove and a kettle for boiling water.
- (17) An electric torch or lamp. Accidents frequently happen in the middle of the night.
- (18) A Thomas' splint is a valuable addition.

The above instruments, lotions, &c., must be looked after periodically. The metal instruments should be kept in an antiseptic lotion like pure lysol or smeared with vaseline and kept wrapped up in lint. The rubber catheters should be kept dry, covered with Talcum powder and stretched about once a week to prevent the rubber perishing.

It is again emphasized that the instruments, appliances, &c., are of much less importance than the ability to use them.

Asepsis and antiseptis. All wounds tend to heal readily in the absence of complications. The most frequent complication is sepsis, *i.e.*, the condition caused by the entry of germs into a wound. The prevention of such entry is called Asepsis. The destruction of the germs once having entered the tissues is called Antiseptis. The ideal to be aimed at in the treatment of a wound is to get aseptic healing, *i.e.*, the wound heals without the formation of pus. Some accidental wounds are contaminated from the start by earth, manure, pieces of clothing, &c. Others, however, are surgically clean to begin with and frequently the misguided efforts made by the sufferer's friends to clean the wound results in its becoming septic.

Dressing a wound. To dress any wound clean or otherwise the following points require attention :

- (1) *The Dresser's Hands* are the most frequent source of contamination. Before performing an operation, a Surgeon scrubs his hands with strong soap and a nail brush for at least 10 minutes under running water. He then soaks his hands in an antiseptic lotion, puts on a sterile overall and sterile rubber gloves. Only then does he touch a wound. In the first aid treatment of casual wounds such an elaborate ritual is not practicable : but every endeavour should be made

by the dresser to clean his hands thoroughly with soap and water in which a little lysol has been poured before he touched the wounded part.

- (2) *The Patient's skin* should be carefully cleaned. This is best done by swabbing the skin in the vicinity of the wound with rectified spirit. Excess of spirit should be wiped off with a sterile swab and the part then painted with Tincture of Iodine. Tincture of Iodine is a powerful antiseptic when applied to dry skin. Hence the patient's skin should not be washed with soap and water if Iodine is to be used immediately after.
- (3) *The Instruments* to be used should be sterilised by boiling them in water for 10 to 15 minutes. They should not be put in a sterile tray or bowl ready for use. A tray can be easily sterilised by pouring a little rectified spirit into it and tilting it so that the spirit comes into contact with every part. The spirit is then set alight. The tray is then sterile and ready for use. A scalpel loses its edge very quickly if boiled and is best sterilised by keeping in pure lysol. When required for use the excess of lysol is washed off with cold boiled water. When facilities for proper cleaning of the hands are not available and even when they are, every endeavour should be made to dress the wound with instruments rather than touching the cut surfaces with the fingers. The reason for this is that no amount of scrubbing or steeping of the hands in antiseptic lotions will entirely free them from germs. Hence the use by the surgeon of rubber gloves.
- (4) *The Wound.* If there is no obvious contamination in the wound, the best First Aid treatment is to apply a sterile dressing without disturbing it in any way. If however there is obvious contamination, the wound should be cleaned by wiping it gently with a piece of sterile wool or gauge soaked in a solution of 1 in 2000 Potassium Permanganate. This piece of sterile gauze or wool should be held in dressing forceps and not in the fingers. If it is necessary to hold the lips of

the wound apart this again should be done with dressing forceps.

- (5) *The Dressings.* It is difficult to sterilise dry dressings without a proper steriliser. Sterilised dressings, however, can be bought in small packets and are very convenient. In their absence a sterilised wet dressing can readily be made by boiling a piece of lint and applying it like a fomentation.

In practice when a wound has to be dressed, the dressings and instruments should be got ready first. The dresser having cleansed his own hands prepares the patient's skin and then proceeds to attend to the wound.

It might be thought that if a wound is contaminated all these laborious aseptic preparations would be unnecessary. So long however as there is only one type of germ in a wound the resulting sepsis may be comparatively mild. If the dresser introduces a fresh type of organism, the severity of the inflammation will be much increased. Hence it is essential for all wounds, clean or otherwise, to be dressed with the utmost care.

The Immediate and General Treatment of Accident and Injuries or First Aid. (Reference is strongly advised to the St. John Ambulance Association book entitled 'First Aid to the Injured,' the contents of which should be at the fingers' ends of all who wish to be prepared to render help to their fellows. What here follows is complementary to the advice and instructions contained therein.)

(1) First of all see if there is bleeding; if so, see where it comes from and follow the directions given under Bleeding (p. 274).

(2) The history of the accident should be ascertained by a few clear questions, addressed to the patient if he is sensible and able to speak, or, otherwise, to the bystanders.

(3) If the patient is insensible, place him on the ground or floor lying rather on the right side and with the head raised to the level of the body by a pillow, folded coat, or other soft substance. This will render the breathing more easy than it would be if the patient lay on the back. Then split open or unbutton any clothing pressing upon the neck, chest, or bowels.

(4) The face and chest should be sprinkled with cold water and then wiped dry, and some cold water may be drunk if the

power of swallowing remains. Wine or brandy should not be hastily given without evidence of its being needed, especially if there is bleeding. Strong hot tea or coffee or milk are safer and of more general use as stimulants than spirits. Other methods of immediate stimulation are: (a) *Sal volatile*, a half-teaspoonful in a little water, when the patient can swallow. (b) Rigorous friction of the limbs upwards. (c) A hot bottle or hot fomentation to the pit of the stomach or over the heart.

(5) The prominent parts of the limbs may be examined with very little movement of the body, and any change of form will probably be recognised by the eye after the clothing has been taken off, which should be accomplished by cutting open, not pulling off. If necessary to remove clothing, do so first from the uninjured side, and carry out the following rules:

Coat. Remove from the sound side first, and if necessary slit up the seam of the sleeve on the injured side.

Shirt and Vest. Slit down the front and remove as the coat.

Boot. Undo the laces and slit the back seam.

Sock. Cut off.

(6) If there be local injury, it should be treated, if possible at once, as described under the different headings.

(7) Allow no useless talking to or in the hearing of the patient, and send away all except those necessary for his attendance. See that he has plenty of fresh air.

(8) In all cases of serious injury aid should be procured immediately. When sending for a surgeon the message should be as clear as possible, and if practicable a written one.

(9) If it is necessary to remove a person after injury in which a limb has been injured, means must first be taken to protect the injured limb, especially in a fracture of the lower extremity. The measures necessary are detailed under 'Fractures'. The greatest possible care is necessary when a fracture of the spine or pelvis is suspected.

After any injury of a severe nature, where it is necessary to move the patient, the person should be carried while lying down. An exception to this rule is injury to the arm or forearm. A hurdle, shutter, door, or *charpoy* (string bedstead) covered with straw, coats or blankets, may be converted into a litter. If poles are procurable, they may be fixed beneath each end of the litter, which will thus be carried long distances more easily. If neither hurdle, door, *charpoy*, nor shutter

can be obtained, a good substitute may be made by fastening four stout poles together and tying a blanket securely to them. Even the cross poles can be dispensed with.

The foot of the litter should be placed at the patient's head in a line with his body. Two people should then place themselves one on either side of the patient, and join hands underneath the body and hips. Another person should take charge of the injured part. The patient should be then lifted, carried backwards over the litter, and lowered on to it. The litter should be carried by the hand, and not on the shoulders, as the patient would be out of sight. The front and rear bearers should start with opposite feet, which prevents lateral motion, resulting from keeping step. In ascending a hill the patient's head should be in front, in descending behind, except in the case of a broken leg or thigh, *when such a course would throw the weight of the body on the injured part.*

Bandages are of two kinds: (1) Esmarch's Triangular Bandage, which is described in detail, together with its application and uses, in the St. John Ambulance first-aid book already mentioned.

(2) *Roller Bandages* are made of strips of linen, calico or flannel, or of porous or solid rubber. A bandage for the arm should be about 2 inches wide by 8 yards long; a leg bandage $2\frac{1}{2}$ inches wide by 10 yards long; and a bandage for the body 5 inches wide by 12 yards long. A bandage ought to be made of one continuous piece without any joinings, and the selvedges should always be torn off. The surfaces and edges should be smooth and even, and there should be nothing which can press unequally on the skin. Bandages should be kept ready tightly and longitudinally rolled up; hence their name 'roller'. This may be done perfectly well by hand, another holding the end of the strip of cloth (see Fig. 14); or it may be fastened to the leg of a table or to any fixed point. Unless this is done there is a difficulty in rolling the cloth smoothly. Besides the roller there are compound bandages, as the 'T'-shaped bandage, the 'figure-of-eight'-shaped bandage, the 'four-tailed' bandage, and various other forms, all described elsewhere in this book.

The principal uses of bandages are: to keep on splints and 'dressings', to protect diseased or wounded parts from injury, to place restraint on motion of injured parts, and to afford support to muscles and vessels. In applying a bandage the first thing necessary is to obtain a point on which the required

traction may be made. Therefore a turn round the *arm* or *ankle* should be taken before the bandage is applied symmetrically to the *hand* or *foot*. Then the roll should be held in the manner represented in Fig. 15 and it should be passed from

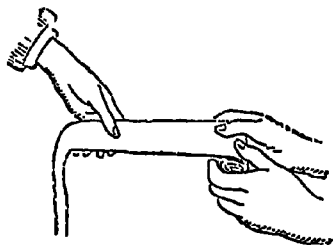


FIG. 14.

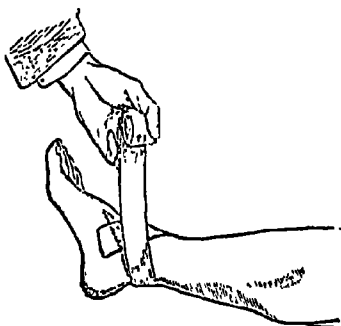


FIG. 15.

one hand to the other as it encircles the limb. A bandage should always be first applied to the extremity of the limb, where it should be tightest, gradually becoming more slack as it ascends, and each fold should overlap about one-third

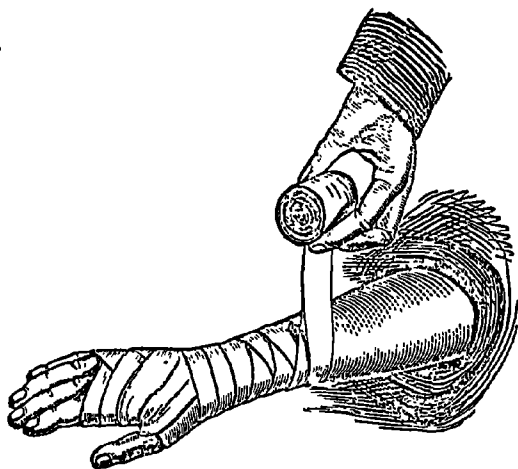


FIG. 16.

of the previous one. No part must be '*skipped*' or left uncovered by the bandage, or swelling of such part will very probably occur, and the roller will become loosened and easily detached (*vide* Figs. 14-16). Further, the bandage

should be applied so that it crosses in front from the inside to the outside of the limb.

Where the limb increases in size the bandage must be turned on itself, as represented in the sketches. This is called the 'reverse'. When a bandage is changed, the part over which it has been applied should be sponged with soap and water and then dried, both for cleanliness and also to prevent irritation from the bandage. When a bandage has to be applied to the head, the hair ought to be combed, so that it may lie flat and not make unequal pressure on the scalp. When a bandage is used to give support or to make pressure, great care should be taken that it is not too tight in any part of its course, as mortification of the limb has been caused by too tight a bandage. It is particularly necessary to bear this in mind when applying a bandage to a limb that has been recently fractured. In such cases the parts are liable to swell, and a bandage which at the time of its application was sufficiently easy may soon become so tight as to cause a dangerous constriction, and this is especially liable to happen if the limb is allowed to hang down. In cases of bad fracture or any severe injury, the bandage should be applied loosely in the first instance, particularly in the neighbourhood of the injury, and as the swelling decreases the bandage may be tightened. As the nails are always left uncovered in the application of bandages, it is a good test of the state of the circulation to make pressure upon them. If the circulation is free, the white mark which is made by pressing upon the nail ought to disappear at once when the pressure is removed. But if it lingers and fades away slowly, the injured limb is too tightly bound, and bandages and splints should be loosened.

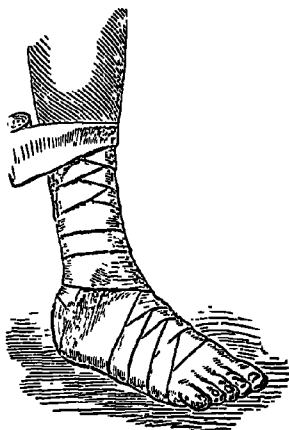


FIG 17.

For first-aid treatment the triangular bandages are to be preferred, and their use is soon learnt; their further advantage for first aid is that they can be readily fashioned from a larger handkerchief, a scarf, or a piece of torn-off clothing.

ANATOMY

To any one who is going to do much first-aid work a knowledge of the anatomy is of the utmost importance. Every opportunity should be taken to study anatomical specimens perhaps especially the articulated skeleton. Anatomy is too big subject to be even touched upon here further than to mention a few facts about the circulation of the blood. (See also Chapter II.)

Blood is pumped from the left side of the heart into a series of strong muscular tubes called arteries. The chief arteries carrying blood to the head are the Common Carotids, one on each side, i.e., the right and the left. Each runs in a line from the inner end of the collar bone (Clavicle) to the angle of the lower jaw and lies in front of the tips of the bones of the neck, part of the spinal column. Below the angle of the lower jaw each Common Carotid divides into 2 branches, the internal and the external carotid arteries. The internal carotid arteries go inside the skull and supply the brain with blood. The externals supply the tissues outside the skull.

The main artery (Subclavian) which supplies the arms and hands with blood passes out of the chest by curving over the first rib. Here it can be felt beating, at a point situated a finger's breadth above the middle of the collar bone (Clavicle). In the arm pit this artery (now called the axillary) lies on the inner side of the arm just under the skin. It continues down the inner side of the arm to a point in the middle of the bend of the elbow where it is deeply placed and cannot be palpated. Here it divides into 2 terminal divisions. One of these runs down the inner side of the fore-arm and is too deeply covered by muscles to be felt. The other, the radial artery, runs down the outer side of the forearm and at the wrist, lies just under the skin. Here the artery can easily be felt and here the pulse rate is usually ascertained.

The main artery for the thigh, leg and foot is called Femoral. This artery enters the thigh at a point situated about the middle of the fold of the groin where it is quite near the surface and can be fairly easily felt. It then runs downwards in a spiral course to the middle of the back of the knee where it divides into 2 branches both of which are deeply situated. These branches go to supply the leg and foot. One of them (the posterior tibial) can be felt beating at the

inner side of the ankle about half way between the prominences of the shin bone (Tibia) and the heel.

The blood inside the arteries, especially in the large ones near the heart, is at a very considerable pressure, approximately 2 lbs. per square inch. Hence the walls of the arteries are very thick and strong.

The blood leaves the arteries ultimately and flows into a series of very minute vessels called capillaries. These capillaries have very thin walls, so that the exchange of oxygen and food materials from the blood to the tissues and of waste products from the tissues to the blood can take place. Having passed through the capillaries the blood goes into the veins. These are a series of tubes which carry the blood back to the heart. The pressure of the blood inside the capillaries is very little and that inside the veins is even less so that the walls of the latter are very thin as compared with the walls of the arteries.

Each main artery described is accompanied by a large vein, but in addition there is a net work of smaller ones which are placed just under the skin, where they can easily be seen.

HÆMORRHAGE

When an artery is cut natural arrest of the resulting hæmorrhage occurs because of the 3 processes :

- (1) The muscle which comprises the greater part of the wall of the artery contracts vigorously so that the lumen of the artery is almost completely obliterated.
- (2) The blood itself on being shed passes over the cut surfaces of the artery and other tissues. This initiates a series of changes as a result of which the blood clots.
- (3) In the case of a large artery bleeding is so profuse that the general blood pressure is lowered. This the clot in the mouth of the cut vessel has every opportunity of ultimately being able to stop further loss.

It is most important for first-aid workers to realise that in 99 per cent of cases hæmorrhage will stop of itself if left alone. Heroic measures with a tourniquet are usually quite unnecessary. The dangers of a tourniquet will be referred to later.

There are 3 types of hæmorrhage—arterial, capillary and venous. Arterial hæmorrhage is characterised by the blood coming in forcible spurts and the blood itself is bright red in colour. In venous hæmorrhage the blood flows continuously in a gentle stream with little or no pressure behind it. In both arterial and venous hæmorrhage if a proper view is obtained it will be seen that the blood is coming from one point. Capillary hæmorrhage on the other hand is hæmorrhage that appears to the naked eye as a general ooze of blood from the entire cut surface.

General Symptoms of Hæmorrhage. A person can lose about 600 c.c. (1 pint) of blood without feeling very marked ill effects. Beyond this amount, however, he begins to feel rather sick. He becomes very uneasy and moves his body and limbs in a restless manner. As bleeding goes on his skin becomes cold and covered with a clammy perspiration. His cheeks by this time are blanched and in addition he is gasping for breath. If the pulse be felt now it will be found to be very feeble, because the blood pressure has fallen and the pulse rate is so rapid as to be almost uncountable.

Treatment. Where venous and capillary hæmorrhage is concerned, the pressure of a well applied dressing will effectively stop the bleeding. In arterial hæmorrhage below the elbow or the knee, the same treatment will suffice, because the pressure inside the arteries in these places is not very high. Where the large arteries near the heart are concerned, i.e., arteries like the axillary or external carotid, something more is required. Pressure by the thumb on the artery at a point nearer the heart than the spot from which bleeding is taking place will of course stop the hæmorrhage, as shown in the frontispiece. But this pressure cannot be used as a permanent measure. To stop such hæmorrhage permanently the lips of the wound should be held widely apart so that a good view can be obtained of the actual bleeding point. It may be necessary, especially in cases where the wound is the result of a stab to enlarge it with a scalpel before the bleeding vessel can be seen clearly. The lips of the wound should then be held apart in such a way, if possible, that the blood instead of collecting inside thus obscuring the operator's view may be swabbed out so as to reveal the bleeding point. Artery forceps can then be applied to the bleeding point. This having been done and bleeding stopped a piece of the previously sterilised

linen thread is placed round the artery just beyond the point of the forceps. The linen thread is tied firmly, but not too tightly, otherwise it will cut through the artery. The artery forceps are then removed. If the linen thread has been properly applied bleeding will have been stopped permanently. The ends of the thread should then be cut close to the

knot. This operation is absolutely necessary only when a really large artery has been cut so that the patient is in danger of bleeding to death in a few minutes if immediate steps are not taken. See frontispiece.

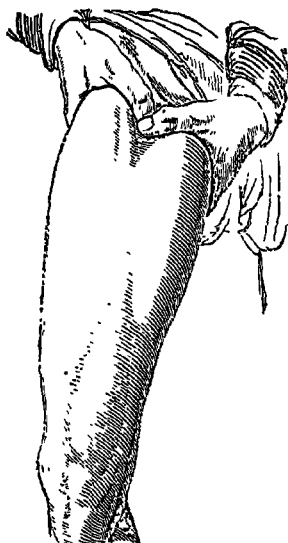


FIG. 18. Pressure on the Femoral Artery.

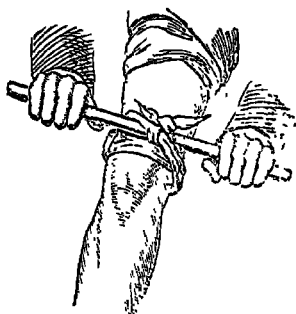


FIG. 19. Tourniquet applied bleeding in Lower Leg.

To those unaccustomed to dealing with bleeding, spurt- ing of a tiny artery that is no bigger than the lead of a lead pencil appears very alarming. It is unlikely that such people will be able to deal successfully with a wound in a large artery. They are therefore advised to apply a firm dressing and hope for the best.

Where wounds of the arm or leg are concerned, bleeding is very easily controlled by the use of a tourniquet. If this method is used the tourniquet should not be left on for more than half an hour at the most. Apart from the pain it causes, if it is left on too long, circulation having been completely stopped, there is a real risk that the limb may become gangre- nous, and have to be amputated. If a tourniquet is used a firm dressing should be applied in the usual way and the

tourniquet removed at the end of about 30 minutes. Serious bleeding will not recur after this time.

In addition to the local arrest of hæmorrhage it is necessary to treat the patient in a general way. The fluid lost should be made up to him by giving him warm drinks of sweet tea or coffee. He should be wrapped up in warm blankets and surrounded with hot water bottles. He should be kept at absolute rest and everything done so as to conserve his strength as much as possible. He is in a condition of shock, the treatment for which in two words is fluid and heat. It is also useful to raise the foot of the bed to facilitate the blood supply to the brain. Stimulants such as brandy should not be given until after the hæmorrhage has been arrested, otherwise the resultant rise in blood pressure may intensify the bleeding. Once hæmorrhage is stopped as a result of the treatment, the part should not be moved. The temptation to change the dressing to see how the wound is getting on should be firmly resisted. Nature will then have a chance to repair the damage that has been done and she can be safely left to do her work without interference.

FIRST AID

First aid is the general treatment of any injury. The treatment is carried out under rather difficult circumstances as a rule and without proper appliances. Hence first-aid treatment is a make-shift and is employed in an endeavour to do the best possible for the patient until skilled medical attention backed by the facilities of perhaps a modern operating theatre is available.

First aid treatment can be considered under 3 headings : (1) hæmorrhage, (2) shock and (3) local lesions. If the patient has a wound which is bleeding freely the first thing that must be done is to arrest the hæmorrhage. This having been attended to, the general treatment for shock, *i.e.*, the administration of fluids and heat should be carried out as far as the local facilities will permit. When these two measures have been taken, *i.e.*, when hæmorrhage has been arrested and the shock is being treated, the local lesion may then claim full attention. The local lesion may be a fracture, a dislocation, a wound or a burn. There is practically always an interval after anti-shock treatment has been begun when it will be possible to deal with the local lesion without causing the patient undue pain. In this

period, i.e. when the patient is recovering from shock an opportunity should be seized to reduce a fracture or replace a dislocated bone or stitch up a wound. When a patient is suffering from shock he does not feel pain very much. Setting a fracture or reducing a dislocation or applying stitches are painful procedures. Further during the shock period, the patient's muscles are completely relaxed and the necessary manipulations in his treatment are thereby greatly facilitated. Still one more point. A grossly displaced fracture is a source of very great pain to the patient and helps to intensify and prolong his condition of shock. Hence it is necessary where at all possible to make some endeavour to replace such a fracture.

When the patient has been treated as far as possible and arrangements have been made for his transport to a house or a hospital, a note should then be made in writing of the history of the accident as far as can be ascertained together with full details as to the treatment that has been given. In recounting the measures that have been taken to treat the patient the writer should remember that it is for the help and guidance of the doctor into whose care the patient will ultimately come. The doctor therefore should be informed of all the details of treatment, especially those the value of which the first aid worker himself is rather inclined to doubt. If the doctor is informed early of any misguided line of treatment that has been adopted as a first aid measure, he can take early steps to minimise its harmful effects. The first aid worker cannot be expected to have a full complete knowledge of surgical technique. He has done his best and no reflection can be cast upon him if he has made any mistake. On the other hand he must be perfectly honest and give the doctor into whose hands the patient ultimately falls a full and complete account of the treatment that has been applied. He needs never fear to do this as the doctor will appreciate it very highly as showing an honest endeavour to help.

INJURIES OF THE SKIN

A bruise is an injury in which the skin is injured, but not ruptured. A bruise is usually caused by a blow with a blunt instrument, which compresses the skin and superficial tissues between the instrument and the subjacent bone,

for example a kick on the shin. The brunt of the injury falls on the blood vessels some of which may be ruptured so that there is an effusion of blood (hæmatoma) under the skin. This shows itself as a dark discolouration which as time passes becomes bluish black and then violet, green and yellow until in about a fortnight the bruise disappears completely. The effusion of blood may be however rather too big in amount to be thus easily disposed of, and a localised collection forms under the skin. So long as this remains aseptic there is no danger, but if germs get into this effusion an abscess will form. The part will then become red, hot, painful, and will swell to a greater or less extent. There may be fever and general upset in addition.

Where an ordinary bruise is concerned no treatment is really necessary. If there is a hæmatoma it will be wise where proper facilities exist to incise the swelling and allow the blood to escape. Where the hæmatoma has become infected and has turned into an abscess incision is still more indicated. But fomentations will go far to relieve the pain and may bring the abscess to a head and assist it to burst externally thus leading to a spontaneous cure.

So long as the abscess remains localised no very drastic methods of treatment are really necessary. But if the lymph glands in the neighbourhood become enlarged and painful this is an indication for draining the abscess by making an incision into it. If the abscess is in the leg the glands affected are those in the groin. If the abscess is in the hand the glands in the arm pit are enlarged and painful. If it is decided to open the abscess, the operation must be done with full aseptic precautions. The operator should choose the most prominent part of the swelling and plunge the knife quickly into it to a depth of about $\frac{1}{2}$ ". The point of the knife having been inserted into the abscess the knife is then quickly drawn downwards for about $\frac{1}{2}$ " so as to provide a big enough opening for the pus to escape. A hot fomentation should then be applied.

Blisters. The skin is made up of two main layers. When the outermost layer is subjected to repeated small injuries, such as the chafing of a boot during a long march, it becomes separated from the next layer by a collection of clear yellow fluid. This is a blister. In itself a blister is not dangerous, but very irritating and rather painful. Treatment should be directed towards keeping the blister

aseptic. For this purpose the layer of skin covering the fluid should be cut completely away, the fluid allowed to escape and the subjacent skin layer washed with a little spirit and then dusted with talcum powder. The old idea of pricking to let the fluid out or pulling a strand of worsted through it so as to drain away the fluid was based on the idea that the layer of skin over the fluid would protect the tissues underneath. Actually all that the raised layer of skin does in such cases is to help to form a little abscess by keeping pent up septic matter underneath.

Wounds and cuts. A sharp instrument causes a clean cut wound. A minimum of damage is done to the surrounding tissues which are not in any way devitalised. Sepsis therefore is not a very common complication or if it does happen is fairly amenable to treatment. A blunt instrument causes a wound that may appear to be just as a clean cut as if it has been caused by a knife. There is however this difference the tissues round about have been severely bruised as a result of the blow. Some of them may be so devitalised that even in the absence of sepsis they will die and be cast off as white sloughs at the end of 10 days or a fortnight. Sepsis is the usual complication of such a wound even where early and efficient treatment has been carried out. The wound caused by a high velocity rifle bullet is of the same nature as a wound caused by a sharp instrument. Wounds caused by a spent bullet on the other hand are accompanied by much bruising and devitalisation of the tissues round about.

Stab wounds are dangerous because of their depth. Important structures deep under the skin may be severed as a result of a stab. To ascertain this and to do the necessary surgical repairs it is frequently necessary to enlarge the existing wound so that its depth may be explored. This can be done with safety to the patient only in a modern operating theatre or its equivalent.

All the above wounds may be free from germs from the moment they have been inflicted or they may be contaminated (even so-called clean cuts) from the beginning. In rendering first aid, whether the wound is contaminated or not, every aseptic precaution should be taken as has already been explained. If the patient is going to be sent at once to a hospital a first aid treatment of a wound should consist merely of arrest of hæmorrhage and treating the patient for

shock. The reason for this is that besides arteries important nerves in the depths of the wound may be injured and proper surgical repair will be necessary. If skilled medical attention will not be available for 2 or 3 days and where the wound appears to be clean, one or two stitches may be inserted so as to bring the edges together. These stitches are most easily inserted by means of a curved cutting needle. The needle should enter the skin about $\frac{1}{2}$ -inch away from the wound, penetrate to the depth of the wound and then be brought out on the other side opposite the point of entry. Sterilised linen thread carried by the needle should be tied just sufficiently tightly to bring the lips of the wound together. If more than one stitch is necessary, a second stitch should be inserted in the same way but should be $\frac{1}{2}$ -inch distant from the first. If the wound is a bruised one, i.e., caused by a blunt instrument it is wiser not to apply stitches, but to apply an aseptic dressing after having cleansed the wound as far as possible. Cleansing of a contused wound includes the removal of any gross dirt, foreign bodies such as a piece of cloth, a button, &c., and snipping away little tags of tissue that are hanging by one end. Such tags will probably die and intensify the inevitable inflammation that will ensue within the next few days. By leaving the wound open, free egress for pus will be given and the risk of blood poisoning will thereby be very much lessened.

If a wound has been contaminated by horse manure, the risk of Tetanus should always be kept in mind and immediate steps taken to have an injection of anti-tetanic serum procured.

Animal bites. One of the worst types of wound to treat is that caused by bites from an animal. These wounds are not only infected from the start, but the tissues round them are very much devitalised as a result of being crushed between the jaws of the animal as well as cut and torn. These wounds always go septic. They should never be stitched up and the first aid cleansing should be of a particularly careful and thorough character.

Foreign Bodies. Splinters of wood, thorns, &c., occasionally find their way into the skin or under the nails and are very difficult to remove. The difficulty of their removal is increased by the intense pain caused by the necessary manipulations. It must be realised, however, that it is absolutely necessary to remove those foreign bodies, otherwise an abscess

will form round them. A pair of fine pointed watch-maker's forceps is a most useful instrument in this connection; but a domestic needle mounted on a piece of wood such as a pen-holder is just as handy. The point of the forceps or the needle should be inserted into the puncture alongside the foreign body and the latter then levered or pulled out. If the foreign body is under the nail the latter should be cut as short as possible so that it no longer covers and protects the splinter underneath. The latter can then usually be easily removed. If all attempts fail a hot fomentation should be applied and removal attempted next day. The fomentation acts by loosening the grip of the tissues on the foreign body making extraction much easier.

Ulcer. An ulcer is a sore that will not heal. The cause of this failure to heal is in the presence of some complication such as a foreign body like a piece of cloth in a wound, or a splinter of wood, or a gross sepsis that is being inadequately treated. Ulcers on the leg are often caused by varicose veins or general diseases such as syphilis. The treatment of ulcers resolves itself into removal of the cause which can be of so many different varieties that it is impossible here to give any indication as to the lines that should be adopted.

Stings. Insect stings and bites are painful not so much because of the tiny wound, but because of the inoculation of a minute amount of intensely irritating poison. Practically all these poisons are acids and are destroyed by treatment with an alkali such as Ammonia or Carbonate of Soda. Treatment therefore of, for example, a wasp or scorpion sting is an immediate application of a little Ammonia or Carbonate of Soda in solution before the poison can diffuse into the tissues. This will relieve the pain and prevent any of the unpleasant general effects these stings frequently produce. This treatment to be effective must be carried out at once otherwise the poison will spread too far in the tissues to be effected by the alkali.

Joints. The two usual results of injury to a joint are either a sprain or a dislocation. A sprain is caused by a wrench to a joint so that the ligaments and tissues, holding the bones together are stretched to such a degree that they are slightly torn. There is small effusion of blood in the tissues round the joint exactly as in the case of a bruise. In addition the membrane lining the inside of the joint reacts by pouring

out a fluid (synovial fluid) which distends the joint cavity and forces the injured parts apart.

The lines along which treatment is carried out is by resting the injured joint. The joint should be surrounded with a mass of cotton wool and a bandage firmly applied so that movement is impossible. If necessary a splint should be applied, and if the joint is a weight-bearing one the patient is kept in bed. A severe sprain should be looked upon as a serious injury. If treated by sufficient rest any sprain will ultimately recover completely. But sufficient rest may mean keeping the patient in bed for 4 to 6 weeks. If the patient becomes fractious and refuses to rest for such a long time, the ligaments round the joint never have an opportunity to recover completely. They remain permanently loose and weak and the joint constantly suffers from minor sprains and other injuries. Massage is no substitute for prolonged rest.

The most common joint to be sprained is the ankle joint. The sprain usually results from the foot being violently twisted inwards so that the ligaments on the outer side are stretched and partially torn. The ankle becomes swollen and discoloured; is very painful and movements are almost impossible. Treatment by a firm bandage and cotton wool as indicated above is most satisfactory. Relief of pain in the first 24 hours may be got by applying cold compresses or hot fomentations; after which cotton wool and a bandage should be applied firmly and the bandage tightened from day to day. In very severe cases a right angle splint should be applied to the leg and foot: the patient kept rigorously in bed and the weight of the blankets kept off his injured foot.

The wrist joint is frequently sprained. The same general line of treatment should be carried out, except that the wrist should be kept in a cocked-up position. If the wrist is allowed to drop and if adhesions follow, the grip in the hand will be very weak whereas if the wrist is kept up even if it becomes somewhat stiff full power will be retained in the hand.

Dislocation. There are only two joints in the body where dislocation is at all common. These are the shoulder and the jaw. Dislocation of the shoulder usually follows a complicated fall in which the arm is twisted as well as violently struck. If conscious after the accident the patient

will give a perfectly correct and reliable diagnosis that he has put his shoulder out. In addition, on examination the head of the bone can be palpated most often under the clavicle but more rarely under the spine of the shoulder blade, and if the fingers are placed in the armpit it will be found that the head is not in the normal position as compared with the other side.

While the patient suffering from a dislocated shoulder may not be unconscious immediately after the accident he is none the less in a state of mild shock and his muscles are relaxed and he will at this time make practically no effort to resist any attempt at replacing the head of the bone in its normal position. The simple and safe method of doing this is to pull the arm outwards and slightly upwards so that the angle between the arm and the side of the body is a little more than a right angle. If an assistant is available he should be directed to join his hands round the shoulder, one hand applied posteriorly and the other to the side of the chest anteriorly in an endeavour to fix the shoulder blade. The arm should be pulled steadily with gradually increasing strength and if the manœuvre is successful the head of the bone will be felt at the end of 2 or 3 minutes to slip into position with a very evident "clunk". This method of reducing the dislocation of the shoulder joint was used by that prince of bone manipulators the late Hugh Owen Thomas.

The after treatment of a dislocation of a shoulder requires to be carried out with considerable care otherwise the movements of the shoulder joint will remain permanently restricted. A large pad of cotton wool should be placed in the armpit so that the elbow is held well away from the side. The arm should be supported in a sling in this position for at least 10 days after this. If the patient is young and if the dislocation has been reduced at once the shoulder joint may now be cautiously moved. The movement that is most likely to be restricted is full abduction, i.e., the patient is likely to find considerable difficulty in stretching his arm above his head. If the dislocation has been accompanied by a good deal of injury to the surrounding muscles and especially in an elderly person the convalescent period may be as long as 4 to 6 weeks. At the end of this time every endeavour should be made by the patient to stretch his arm above his head. If these efforts are accompanied by really severe pain it is probable that the dislocation has been

complicated by a fracture and an X-ray examination should be done.

Dislocation of the lower jaw is frequently caused by excessive muscle action, *e.g.*, prodigious yawn or a more than ordinarily hearty laugh. The mouth remains open and cannot be shut, speech and swallowing are difficult and saliva dribbles away. The chin protrudes so that the lower row of teeth projects beyond the teeth of the upper jaw. Sometimes only one side of the jaw is dislocated and then the teeth are displaced laterally away from the dislocated side.

Before commencing any manipulation the operator should place a large cork between the front teeth of the patient and ensure that it will not slip. He then places each of his thumbs on the teeth of the lower jaw as far back as he can, and presses downwards and backwards, at the same time trying to tilt the chin upwards in an endeavour to lever the condyle of the jaw back into position. This as a rule is not difficult and the operator knows that the dislocation has been reduced by finding the patient's jaws suddenly tend to close with a snap. If the cork has slipped during his manipulations the operator's thumbs will be very severely crushed.

Dislocations occasionally do occur in other joints such as the collar bone and the hip. In the case of the collar bone the arm should be supported in a sling and in the case of the hip the leg should be splinted as in a fracture of the thigh bone.

Inside the knee joint are two crescentric pieces of cartilage called the semilunar cartilages, one on the outer and the other on the inner aspect of the joint. In a violent twist of the knee joint these cartilages are sometimes torn from their attachments and nipped between the two ends of the bones so that the joint is locked and full flexion and extension is impossible.

An attempt may be made at once to replace the cartilages in position. The patient is laid flat on his back and the hip and the knee joints flexed as far as possible so that the affected knee is almost touching the patient's shoulder. The operator then grasps the patient's foot twisting it outwards firmly as far as it will go and then tells the patient to straighten his leg vigorously. At the same time the operator helps the straightening by pulling on the foot and twisting it inwards as extension is applied. The cartilage will then go

back with a click and full range of movements will be restored.

In dislocations as in all joint injuries massage carried out by a trained masseuse gives great relief to the sufferer and promotes early subsidence of the swelling and inflammation. It should however be realised that massage by itself is no substitute for a reduction of a dislocation. It is an adjunct to treatment and nothing more, and if the dislocated joint has been reduced and rested for a sufficient length of time recovery will be complete without any massage or fancy and expensive electrical treatment.

The same general principles hold good in the after-treatment of a dislocation of any joint.

FRACTURES

A simple fracture is one in which a bone is broken without there being a wound leading from the skin to the broken ends. If this latter happens the fracture is said to be "compound". These fractures are as a rule the result of indirect violence, e.g., a patient falls on his hand and breaks his humerus above the elbow. A 'comminuted' fracture is one in which a bone is broken into several pieces and is usually caused by direct violence, e.g., a blow with a stick. Occasionally the force causing a fracture continues to act after the bone has broken, and jams one end into the other; this type of fracture is called "impacted". In children whose bones are very soft the bone instead of breaking may bend like a green twig, but unlike the green twig its elasticity does not immediately undo the deformity. This type of fracture is called a "green stick" fracture. While very painful at the time it causes no permanent disability; no efforts to straighten the bone need be made as it will straighten itself if left alone and guarded from further injury by a suitable splint. Diagnosis should always be confirmed by X-ray examination.

Fractures are sometimes complicated by other injuries, such as tearing of nerves or vessels or dislocation of a neighbouring joint. These injuries are very severe and their treatment should be carried out only by an expert.

The general symptoms and signs of all fractures are pain, alteration of shape, grating of the broken ends on movement, inability to use the limb, but increased mobility in the hands of

the examiner. Swelling appears some time after the fracture has taken place. The diagnosis of a fracture is usually very easy and if the first aid worker has any doubt the patient himself as a rule has none, and will state quite definitely that he has broken a certain bone in a certain place. Such a definite statement on the part of the patient should be believed and fracture treatment carried out. If such signs as abnormal mobility and grating "crepitus" of the broken end cannot be made out, but the patient asserts a bone is broken, it is usually found that there is an impacted fracture. The bone should therefore be splinted and the routine treatment of a fracture instituted.

The ideal treatment of a fracture is to replace the broken pieces of bone in their normal position and keep them there until they unite. This, however, demands not only an accurate knowledge of the anatomy of the part, but also an accurate idea of the position of the broken pieces. It is usually possible by feeling the injured part very carefully to form a fairly good idea as to the state of affairs; but occasionally the bone is covered with muscles so that it is quite impossible to obtain much information by palpating, and an X-ray examination is almost an essential before adequate treatment can be carried out. The first aid worker would be well advised to have as his ideal method of treatment of a fracture, such measures as will prevent the deformity increasing. Very often as a result of bad preliminary treatment a simple fracture is converted into a compound one or a previously uninjured main artery or important nerve is torn. Further, it should be realised that in the absence of movement of the broken fragments the patient's sufferings are at a minimum, and a well applied splint will enable him to be transported to his home or to hospital without very much pain.

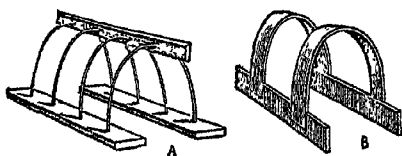


FIG. 20. Cradles for keeping the bed-clothes off a fractured limb.

To immobilize a fracture, *i.e.*, to bind it up so as to prevent movement of the injured part, splints, padding and bandages

are required. In first aid work proper splints are frequently not available and have to be improvised. Thin strips of wood, card board, newspaper folded several times on themselves, bundles of twigs tied together, reeds, &c., have all been impressed into use with great success. The splints do not really require to be very strong and if it is felt that they may give way they can usually be strengthened by some such measure as putting two sandbags one on either side of the broken bone or by tying one leg to the other or the arm to the body.

Before applying splints of any description an attempt should always be made to cover the limb with some sort of padding. Cotton wool is the best substance for this purpose but any soft material will do. If a splint is bandaged to bare skin, especially if the splint touches a bony prominence, the skin is very apt to give way under the pressure and an ulcer will form which will take a very long time to heal.

All the necessary appliances, splints, padding, bandages, &c., should be got ready before beginning work on the patient. If the limb is to be kept in these splints for 2 or 3 days, the patient's skin should be carefully washed, dried and dusted with Talcum powder, so as to minimise the chances of pressure sores or abrasions by chafing. The part should then be well padded, especially the bony prominences and where the bandages are to be applied. The splint should be bandaged firmly and should be sufficiently long to prevent movement not only in the broken part, but also in the joints above and below. It is always a wise precaution to feel the pulse at the wrist or the ankle before and after applying a splint to the arm or leg. If the pulse can be felt equally well after as before, there is then no fear that the circulation has been impeded. As an additional precaution it is well to inspect the fingers or toes about an hour after. If they are pale and cold it means that the bandages have been drawn so tightly that the arterial circulation has been stopped. If on the other hand the hand or foot is slightly swollen, blue and tingling it means that the venous return has been stopped. In either case the bandages should be taken off and re-applied after having padded the limb more thickly.

If the patient has a long journey in front of him, in addition to such ordinary precautions as making provision for food and drink, an enquiry after the state of his bladder and bowels should always be made. In the shock, pain and

general discomfort of his accident the patient may temporarily easily forget that he has a distended bladder.

In the further treatment of a fracture an attempt at reduction must be made. Restoration of anatomical continuity will frequently be impossible especially in the absence of such facilities as general anaesthesia to assist reduction and an X-ray examination to check its efficiency. If, however, the bone is put in such a position that the general direction of the lines of force will be the same after union as before the fracture occurred, no very great disability will result. On the other hand if the bone unites so that there is an angulation between the two parts it is obvious that the lines of force will fall in an abnormal direction on the joint below. It frequently happens that a badly fractured bone with overlapping of the fragments gives rise afterwards to very little disability. This is because the lower fragment has united with the upper in a position very nearly parallel to the normal. Thus the mechanism of the joint below is not disturbed. On the other hand some simple fractures with very little displacement are allowed to unite so that the lower fragment forms an angle with the upper. In these cases the joint below invariably becomes painful and gives trouble when it is used, because it is being made to withstand pressure from an angle for which it was not constructed.

These facts should be kept in mind when attempting to reduce a fracture in the absence of expert assistance.

Reduction having been effected and a suitable splint applied the best thing that should be done is to leave the fracture alone until it has firmly united. It is of course necessary to readjust the bandages, paddings or perhaps the splints themselves; but as far as possible the bone should be left undisturbed.

The question arises, when should the splints be removed: and the correct answer, "when the bone has united," gives very little assistance. There are so many factors governing the time during which a fracture should be kept immobilised, that only the vaguest of general guides can be given. A fracture of one of the finger bones is usually fairly firm in 3 or 4 weeks. A fracture of a large bone like the thigh bone requires 3 or 4 months before it is fit to bear weight; other bones vary accordingly. A very useful clinical guide is the presence of pain in the site of the fracture when the patient moves the part or uses it in any way. It may be taken that

pain in a fracture is a danger signal and means that the fractured part is being asked to do more work than it can stand. Where the leg bones are concerned this danger signal is especially important and should never be ignored. If after having been kept in splints for 3 or 4 months and after a patient has been encouraged to move about on crutches for a further month, a case of a fracture of the femur still finds he has pain in the site of the old fracture when he attempts to put his full weight on the injured leg, he should be warned that further rest is necessary. If he persists in attempting to walk, the newly joined bone which is still soft, will gradually bend under his weight. An angular deformity will result and an inflammation in his knee and ankle will ensue which may well cripple him for the rest of his life. On the other hand a little more patience would ensure him a sound leg.



FIG. 21. Four tailed Bandage on Lower Jaw.

Fracture of the lower jaw.

The lower jaw is usually fractured on one side, the crack running through the socket of a tooth. As a rule there is not much displacement as the muscles attached to the bone tend to keep it in position. The patient complains of pain at the site of the fracture and he can feel an irregularity of the bone with his tongue. The fragments can be moved one on the other quite easily by grasping them firmly, one finger inside the mouth, the other outside, and exerting pressure in different directions.

The upper jaw acts as an excellent natural splint when the mouth is kept closed. For this purpose a four tail bandage is used. This consists of a piece of strong cloth about a yard and a half long and 4 inches wide. Each end is torn longitudinally so as to leave about 8 inches in the middle in which a slit should be made for the chin. The slit should be about an inch from the upper margin of the bandage so that the latter will not cover the lower lip or mouth. Two of the tails are tied over the crown of the head and two at the back of the neck. For permanent treatment the same

bandage applied over plaster of Paris casing that fits the jaw accurately is one of the best forms of treatment. The mouth is kept closed in this position for 3 or 4 weeks, feeding being carried out by means of a tube passed along the cheek to the back of the mouth, fluids being given by this means. Firm union is frequently delayed and even in a favourable case no attempt at chewing should be made until after 6 weeks. Dribbling of saliva from the mouth necessitates frequent changes of dressings. Attempts should be made to wash out the mouth with 1 in 3000 Potassium Permanganate, as otherwise it tends to become very foul and is a source of great discomfort to the patient.

Fracture of the nose. The nose as a rule is displaced to one side and also driven slightly inwards. The fracture is usually of the impacted variety and if any difficulty is experienced in pushing the nose straight the attempt should be given up as special instruments are required for disinfection. Bleeding is very rarely troublesome. The patient should be directed to wash out his nose with weak Potassium Permanganate lotion and a cold water compress may be applied to relieve the pain. Otherwise the condition is best left alone.

Fracture of the Collar Bone (Clavicle). Fracture of this bone occurs perhaps more frequently than in any other bone of the body. The clavicle lies just under the skin and can easily be felt and seen along its whole length. Fractures are usually easy to diagnose by looking at and feeling the injured bone and comparing it with its fellow on the other side. The site of fracture is as a rule about the junction of the outer third with the inner two thirds of the bone. The shoulder as a whole is seen to be displaced downwards, inwards and forwards. The patient is unable to raise his arm upwards, and supports his elbow and forearm with the other hand.

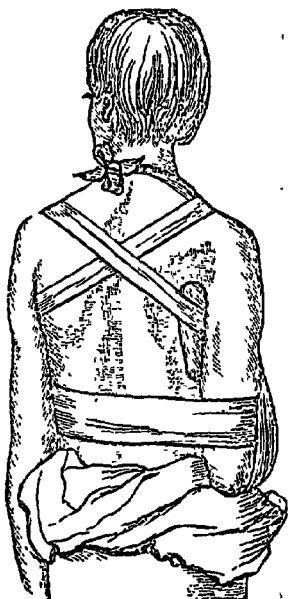


FIG. 22. Bandage for fracture of Right Collar Bone.

A simple method of treatment is to place a figure of 3

bandage round both shoulders so that the injured one is pulled backwards. The skin should be carefully washed, dried, powdered and padded with cotton wool before the bandage is applied. Another and perhaps easier method is to put a ring of bandage cloth round each shoulder padded as before, and then pull the one ring towards the other by a bandage applied behind. A large pad of cotton wool should then be placed in the armpit and the bent elbow bandaged firmly to the side so that the shoulder is levered outwards over the axillary pad. A string round the forearm tying it to the neck takes the weight of the arm off the injured shoulder and completes the treatment.

It is very difficult to get a perfect cosmetic result in fractures of the clavicle. Almost always a prominent lump remains over the site as a monument to the accident. The functional result however is almost invariably excellent and within a month the patient is usually able to go about comfortably and even use his arm a little although he would still be wise to keep his arm in a sling for a further week or two.

Fracture of the upper part of the arm bone (Humerus). Fractures in this position may be confused with a dislocated shoulder; but if the arm is pulled gently from the side of the body, it is very easy to feel the head of the bone in its normal position and one of the broken ends lying just under the skin. Examination of the other side will confirm these observations. Crepitus is easily elicited and if the arm be pulled away from the side in the same way as was described in reducing a dislocation of the shoulder, the deformity will be found to be easily reduced, but will recur as soon as traction is stopped. In both these respects the fracture differs from the dislocation which is difficult to reduce, but once reduced shows no tendency to recur.

To treat this fracture a large pad should be placed with its apex in the armpit and its base below so as to keep the elbow about 6 inches from the side of the body. A bandage encircling the arm and body is then applied over a short outside splint on the arm. The weight of the arm should be supported by a sling. Owing to the close proximity of important nerves as well as the main vessels of the arm fractures in the upper part of the humerus should be carefully treated. The pulse should be carefully noted before and after bandages have been applied and compared with the

pulse on the opposite side. If no pulse can be felt on the injured side before it has been immobilised, surgical attention should be procured at the earliest possible moment. A rough but valuable test for the integrity of the nerves is to ask the patient to open and close his hand. If he can do this in a normal way it is not likely that any very grave damage to the nerves has been done.

To reduce a fracture of the upper part of the humerus is not easy. If the condition is going to be treated permanently, the best thing is to put the patient to bed, raise his injured arm until it is almost at right angles to his body and fix it there with sandbags after having applied splints. The part should be kept immobilized in this position for at least 6 to 8 weeks after which movements short of causing pain may be gradually allowed. This treatment may result in a little deformity, but a very considerable range of movement will be obtained and the functional result should be quite good.

Fracture of the middle of the humerus. A fracture in this situation is very easily detected from the deformity, the grating, the bone being movable at the broken point where it should be firm, the local pain, and the inability to use the arm.

An attempt should be made to set the fracture by bending the elbow and pulling on it with a steady firm pull equal to about 10 lbs. weight. If an angled splint is available this should be applied, but in its absence the fracture can be quite well controlled by a long straight splint on the outer side of the arm reaching from the shoulder to the wrist, and a shorter one on the inner side of the arm reaching from the armpit to the elbow. Special care should be taken that this short internal splint does not press either on the bony prominence on the inner side of the elbow joint or on the nerve immediately behind it. The best way to make certain neither of those accidents can happen, is to pad the arm above the elbow joint so that there is no possibility of contact

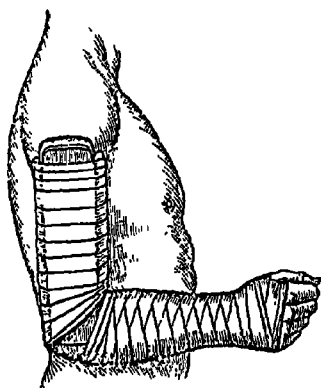


FIG. 23. Splints and Bandage on Broken Humerus.

between the splint and these vulnerable points.

For some unknown reason there is a special tendency for a fracture of the shaft of the humerus not to unite. The causes of non-union of a simple fracture are not fully understood, but the following seem to be among the main reasons:

- (1) Lack of proper reduction. This frequently results in a mass of muscle or other tissue being left interposed between the broken ends.
- (2) Lack of efficient and prolonged immobilisation. This appears to be a most important factor. There is a very definite danger that non-union will occur if the splints are removed early so as to allow massage to be carried out by any but the real expert.

Fractures of the lower end of the Humerus. The commonest variety of fracture in this situation is a fracture

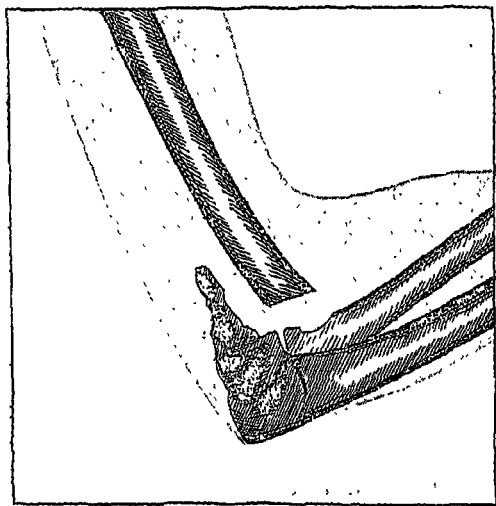


FIG. 24. X-ray picture, showing a fracture of the lower end of the humerus with overlapping. (Dia ramatic.)

running transversely across the bone about an inch above.

the elbow joint. The lower fragment is displaced backwards and the lower end of the upper fragment is pushed forward into the hollow in front of the elbow joint. The two fragments practically always overlap as shown in the X-ray picture No. 1 to a greater or less extent thus making it difficult to reduce the deformity. The fracture is usually caused by a fall on the outstretched hand, the weight of the body being taken by the arm with the elbow slightly bent. In severe cases the fracture is comminuted, a large fragment is frequently split off the shaft of the humerus and the small piece of bone below may be broken into two pieces so that the general shape of the fracture is that of a T.

On examination immediately after the accident a good deal of swelling will be seen round about the elbow joint both in front and behind. When this is carefully felt it will be found that the swelling is caused by the displaced pieces of bone. If the elbow joint is gently moved it will be found that while flexion is very much limited it is possible to move the arm from side to side in a way that is quite impossible in the sound limb. This lateral mobility will be accompanied by crepitus.

The main blood vessels of the forearm lie just in front of the elbow and in fractures of the lower end of the humerus are very frequently pressed upon by the displaced lower end of the upper fragment. This pressure affects mainly the veins and if it is not relieved the muscles in the forearm may have their blood supply so impaired that they degenerate. The condition known as "Volkmann's Ischaemic contracture" results in which the fingers are kept bent and the hand is almost useless.

To prevent such untoward results it is absolutely necessary to reduce the fracture early and efficiently. An X-ray picture is almost an essential for this purpose and no time should be lost in transporting the patient to a place where this method of examination can be carried out.

Attempts at reduction by the first-aid worker are likely to do far more harm than good and may cause the complication they are designed to prevent. Having made the diagnosis the best thing that can be done is to apply two splints one on each side of the arm each splint extending from about the middle of the upper arm to the wrist. No attempt should be made either to bend or straighten the elbow. The arm should be immobilized in the position it naturally adopts

which is usually a few degrees short of full extension. In applying the splints every effort should be made to prevent pressure in the region of the elbow joint. The bandages should be applied above and below and the region of the fracture left alone. It is specially important to feel the pulse at the wrist of the broken arm before and after the splints have been applied. If the pulse has disappeared as a result of too tight bandaging as not infrequently happens this must be corrected.

Fracture of the prominence of the back of the elbow (Olecranon). This fracture frequently follows a violent attempt to straighten the elbow joint. A powerful muscle the triceps is fixed into this piece of bone and under certain circumstances snaps it off.

The patient finds he is unable to straighten his arm and when the site of pain at the back of the elbow is investigated it is found that the prominence is above its normal position and separated from its parent bone (the ulna) by a gap. It is not possible as a rule to feel crepitus since the broken surfaces are separated from each other.

To obtain a really good functional result this fracture should be treated by open operation. The surgeon cuts down and exposes the pieces, clears away any blood clot and torn tissues that may be lying between the fragments and brings these together by boring a hole through each piece and tying them together with a piece of wire or some such material. If an operation of this type is not done the fragments do not unite properly, fibrous tissue and not bone bridging the gap. This fibrous tissue is much too weak to bear the strain of muscular activity. Thus a permanent weak arm results.

First-aid treatment consists of splinting the arm with the elbow in a straight position. A long anterior splint reaching from the middle of the upper arm to just above the wrist is best for this purpose. It should be fixed in position by bandaging the two ends to the arm. A separate bandage is then applied in the region of the broken bone, the first few turns of the bandage being just above the upper fragment so as to prevent further upward displacement. As a permanent method of treating fracture of the olecranon by non-operative methods, the above measures are as good as any and are much the simplest. The bandages require to be adjusted and tightened from time to time. Otherwise immobilisation is kept up for 6—8 weeks after which movements

may be gradually allowed. Efforts to pull the upper piece down by such methods as pulling on the ends of a horse shoe shaped piece of strapping placed just above the bone, fail because it is very difficult to prevent the skin ulcerating at the edge of the plaster.

Fracture of the bones of forearm. There are two bones in the forearm, the ulna and the radius. The ulna lies behind and can be felt throughout its whole length from the back of the elbow to the back of the wrist on the inner side just above the little finger. The radius is situated on the outer side of the forearm and is covered with muscles so that only the upper and lower ends can be felt. The head of the radius is a thick disc of bone that can be felt most easily at the outer side of the back of the elbow joint. The lower end of the radius is the big mass of bone on the outer side of the wrist.

Both the radius and ulna are frequently fractured as a result of falls on the hand. The bones usually give way at different levels. The lower part of the forearm is seen to be at an angle in relation with the upper and if it is handled, it will be found possible to move the lower part on the upper. Grating of the broken fragments is frequently present. If it is absent altogether it means that the broken ends are buried in muscle and that the displacement of the fragments is very great.

Treatment of this serious variety of fracture is surgical. An X-ray picture is an essential preliminary to thorough and efficient reduction. First-aid measures consist in the application of a long posterior and a short anterior splint, the arm being as usual well padded. The posterior splint should extend from the middle of the upper arm to the knuckles. The hand is twisted so that the palm looks forward and then the hand, wrist, elbow and upper arm are firmly bandaged to the splint. By this means the joints above and below the fracture are completely immobilised. A short anterior splint can be applied from the elbow to the wrist to give still further support. The arm should then be bandaged to the body and thigh so that the patient may be moved to hospital in comfort. If a surgeon is not available and permanent treatment is going to be carried out, the arm and the hand should be immobilised in the above position for about 2 months. An angled splint is perhaps more comfortable and convenient, but it is more difficult to apply properly

and requires more attention afterwards.

If only one bone is broken, treatment is much less difficult. The ulna is not infrequently fractured as a result of direct violence, for example a blow with a stick. In such cases the radius acts as a most efficient internal splint. The fragments of the ulna are not much displaced as a rule so that if a light posterior splint is applied reaching from the elbow to the knuckles, with the elbow joint flexed, and the hand turned so that the palm looks upwards, an excellent result will be obtained. The patient's forearm splinted as above should be supported in a sling for 6 or 7 weeks after which the supports may be gradually discarded.

Occasionally, however, one bone is fractured and on feeling for the broken end it is evident that there is considerable overlapping. This can take place only if the other bone is dislocated. Thus if the ulna is fractured the head of the radius will be dislocated at the elbow joint, and if the radius is fractured the lower end of the ulna will be found dislocated at the back of the wrist joint. These complications of fracture of one bone of forearm are very serious and are but too frequently overlooked. An X-ray examination and prompt expert attention is necessary in these cases.

Fracture of the forearm close to the wrist, Colles' fracture. This fracture is very common and practically always

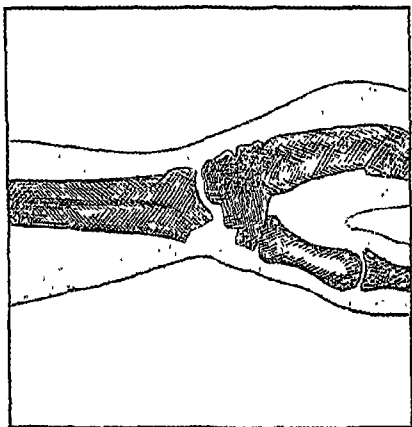


FIG. 25. X-ray picture showing a Colles' fracture. (Diagrammatic.)

follows a fall on the outstretched hand, an accident

which can cause so many different varieties of fracture. The radius gives way about an inch above the wrist joint, the lower fragment is forced upwards and backwards and driven into the upper so that the fracture is of the impacted variety. As a result of the impaction the usual signs of a fracture, viz., crepitus, and abnormal mobility are absent: but the characteristic deformity enables the practised eye to diagnose the condition at a glance. The lower fragment of the broken bone forms a marked projection at the back and leaves in front just above the line of the wrist joint a corresponding depression. See the X-ray picture No. 25:

It is absolutely essential to reduce this fracture if a useful wrist and hand is to be expected. Because of the impaction a considerable amount of force has to be used and a general anæsthetic is almost an essential. In the absence of expert medical assistance the first thing to be done in the setting of this fracture is to undo the impaction. For this purpose the small lower fragment is grasped firmly along with the hand and bent forcibly backwards. This manoeuvre increases the deformity but unless it is carried out thoroughly it will be found to be impossible to carry out the next step. Having disimpacted the fracture the hand is then firmly grasped as if shaking it: the forearm being held steady by an assistant endeavour is made to pull the displaced fragment first downwards and then forwards by deviating the patient's hand forcibly first towards the inner side of the wrist and then twisting the hand forwards, the upper arm being kept immobile while this is being done. If reduction is complete it will be found that the hand can be turned from side to side (pronated and supinated) quite freely: prior to reduction this movement is very limited. Having reduced the fracture, a firm pad is applied behind the lower fragment and a similar pad in front of the lower end of the upper fragment. Two splints which have been previously got ready and fitted to the patient's arm are then bandaged firmly in position. The back splint extends from the elbow to the knuckles and the anterior splint from just below the elbow to just below the wrist. The splints should be applied with the hand palm upwards. The forearm is then supported by a sling. Immobilisation should be continued for at least a month.

A bad result very frequently follows this type of fracture. This is usually because the fracture has not been properly reduced to begin with. But sometimes it is due to too hasty

removal of the splint to perform massage. The first-aid worker is not very likely to commit the latter error. If he is compelled to treat this fracture from start to finish he should realize that a proper reduction will tax his physical strength to the utmost. The pain he will cause the patient when the bones are being set will be very great, but it may be of comfort for him to know that it is almost impossible for him to do any great harm and quite impossible for him to over-reduce the fracture.

Many other kinds of fractures in the region of the wrist joint occur besides Colles' fracture. As a rule they are not so serious, the displacement of the fragments is not so great and reduction is easier, an X-ray photograph however being

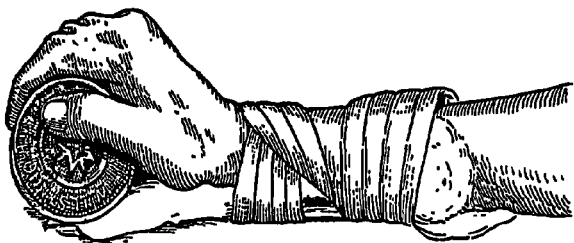


FIG. 26. Showing a ready way of setting up fracture near the wrist joint.

almost essential if this is to be done accurately. A rough, but very effective, method of treatment for all these fractures is to apply a cock-up splint, i.e., a splint which extends from

the middle of the forearm to the middle of the palm of the hand so shaped that the wrist joint is bent upwards. A splint of this description can be readily improvised by nailing an empty Gold-flake cigarette tin to a piece of wood. See figure No. 26. This position of the wrist is the best for any kind of injury in this region except a Colles' fracture. In this latter the fragments tend to slip back if a cock-up splint is used.

Fractures of the bones of hand and fingers. These injuries are recognized by the attending swelling, pain and grating. If only one of the long bones in the palm of the hand is broken, the others act as a splint so that displacement is usually very little. If the hand is rested in a sling with a firm bandage for 3 or 4 weeks the fracture will usually unite with very little deformity or disability.

If several bones are broken, some sort of support is necessary. A large firm ball of tow or a roll of bandage or an empty cigarette tin should be placed in the palm of the hand. The bones here (metacarpals) are naturally curved anteriorly and the curved anterior splint supports them so that they retain their natural shape while healing. The hand and fingers are bandaged round the curved support in the palm, and the hand and forearm supported in a sling. The same period of time is necessary for union whether one or many bones are broken.

Fractures of any of the bones of the fingers (phalanges) are not usually attended with any gross deformity. At the point of fracture there is usually a little side to side angulation in one direction or another. This is very easily corrected by manipulating the pieces so that the distal part comes into alignment with the proximal. A piece of card board of suitable width and length is a strong enough splint. A piece should be applied on either side of the finger if the distal phalanges are broken. If the proximal phalanx is fractured, the splints should be applied to the front and back of the finger and should extend into the middle of the palm. Plenty of cotton wool, a firm bandage and a sling as before completes the treatment.

Fractures of the ribs. A rib is usually fractured as a result of a severe crush of the chest. In these cases the site of fracture is at the angle of the rib behind and not where the crushing force is applied. Occasionally a rib is broken by direct violence, *e.g.*, a kick, and then the site of fracture corresponds with the injury to the skin, etc. The kick may

be particularly violent, so that the broken ends are driven into the chest injuring the pleura and lung as a result.

In the absence of any injury to the structures inside the chest a fracture of one rib is of little moment. The other ribs act as perfect splints and non-union or malunion is practically unknown, even if no treatment whatever is applied. The pain of a broken rib is fairly severe to begin with; but as a rule this quickly disappears and in the absence of fresh injury union takes place without any trouble.

At the time of the injury the patient may be suffering from shock which will require treatment. As far as the rib itself is concerned a few pieces of adhesive plaster put on while the patient has breathed out deeply will help to ease his pain. Each piece of strapping should begin in front over the breast bone and be drawn tightly round the chest to finish across the middle line behind. The strapping should be about an inch and a half broad and each piece should overlap the one below it, the lowest piece having been first applied; four or five pieces are usually all that are required. At the end of a few days this strapping will probably have loosened its hold on the skin. If the patient is not suffering from very much pain it is probably best to leave him alone, otherwise fresh pieces may be applied in the same way.

If several ribs are fractured breathing may be seriously impaired especially during the time that the patient is suffering from the shock of the accident. Little can be done in the way of treatment of the broken ribs to help him. General treatment of shock should be given and a generous dose of alcohol. The patient should be made as comfortable as possible where he is, and his transport to his home should be delayed until he has recovered a little. This may mean waiting for 3 or 4 hours and if a convenient cottage is near the scene of the accident the patient should be taken there rather than made to undergo the strain of a journey at once.

Where several ribs are broken strapping applied as before may help a little; but quite frequently it does more harm than good. Usually compensation establishes itself naturally within a day or two and the patient's breathing becomes much less laborious and painful. First-aid treatment should be of a general type, careful nursing being of much more importance than any local treatment applied to the ribs themselves.

The severer forms of injury to the chest wall involving multiple fractures of the ribs on both sides are frequently

rapidly fatal. They result usually from a very forcible crushing accident. The patient is practically always unconscious when first seen, and very little can be done other than to begin treatment for shock and make arrangements for his immediate transport to a hospital.

Fracture of the pelvis. The bony pelvis consists of a complete ring of bone situated at the lower end of the spinal column. The bones forming this ring are very strong and are rarely fractured except in very severe crushing injuries such as a horse rolling over its rider. Displacement of the fragments is not very great as a rule. Immediately after the accident the patient is usually in a state of profound shock. His injuries are frequently multiple, but as far as the fracture of the pelvis is concerned the danger lies in rupture of the bladder or urethra for which immediate surgical treatment is necessary.

A broad piece of cloth should be bandaged firmly round the injured part and the patient transported to hospital with every speed, and the patient should be told not to attempt to pass water.

Fractures of the femur. The femur is the bone that extends from the hip joint to the knee joint. It is a large bone and fracture is usually accompanied by a good deal of shock. In alcoholic subjects the injury is frequently followed by delirium tremens, and in old people the prolonged treatment in bed this fracture necessitates frequently leads to a variety of pneumonia. The bone is thickly covered by muscles. It is therefore difficult to feel the broken ends and accurate reduction of the fracture is very difficult. This difficulty is further increased by the fact that there is frequently considerable overlapping of the fragments. The powerful muscles round the bone make it impossible to correct this overlapping by any method other than prolonged and powerful pulling on the lower fragment. Altogether a fracture of this bone is a problem that presents a very considerable difficulty to a surgeon who has every facility for diagnosis and treatment at his command. Even then the functional result of his treatment is not infrequently far from perfect. Elderly people frequently break the neck of the bone at the hip joint as a result of some very trivial mishap, e.g., a stepping off the edge of pavement twisting the hip joint in doing so. In such cases non-union is not infrequent even where treatment has been carried out with the utmost

skill from the start. This type of case used to be considered so unsatisfactory that a generation ago surgeons used to concentrate the whole of their endeavour on the general condition of the patient and neglect the fracture completely.

Fracture of the upper end of the femur. This fracture is marked by inability to stand, shortening of the leg and turning out of the toes so that the heel of the injured limb is resting on the instep of the other foot. On rotating the leg crepitus may be felt in the region of the hip joint.

Treatment in the first place consists of immobilising the leg by means of a long splint that extends from the arm pit to the ankle. Very careful padding over the bony prominences in the region of the hip, knee and ankle is necessary if the splint is to remain in position for any length of time beyond a few hours. The upper part of the splint should be bandaged firmly to the body. The foot is then pulled downwards and twisted inwards and bandaged to the splint while a traction is still maintained. As an additional source of support during the journey to hospital the limb should be bandaged to its uninjured fellow.

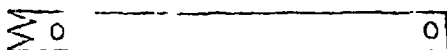


FIG. 27. Long splint for thigh.

As indicated above permanent treatment is for the experts. In his absence a method that will give quite good results is to separate both legs as much as possible by pulling the feet apart and keeping them in this position by bandaging a splint between the two feet and applying sand bags on the inner side of each leg. Special care must be taken to check the tendency of the foot to fall outwards. A sand bag on the outer side of the foot and leg answers very well for this purpose. Nursing presents considerable difficulties. A broad sling under the loins can be used to help to raise the patient so as to put a bed-pan underneath him. The tendency to bed sores should never be forgotten and the patient's back should be carefully examined every day, washed, dried, rubbed with spirit and powdered regularly morning and evening. These nursing points are made very much easier if a rope is fixed to the roof so that the patient can help to pull himself up by his arms. Old people are best treated propped up in bed with pillows or a bed rest, and this luxury need not be

denied to younger patients. In favourable cases bony union cannot be expected before about 3 months but the patient may be allowed out of bed on crutches a little before this time. An X-ray examination should always be done prior to allowing him to return to normal activity.

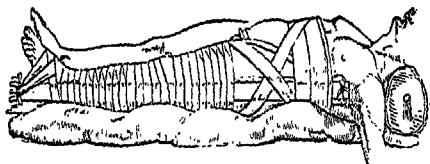


FIG. 28. Fractured thigh.

Fracture of the middle of the femur. In this variety of fracture the thigh is shortened, there is crepitus when the part is moved, and there is abnormal mobility at the site of the break. The line of fracture is very often oblique. The force of the injury assisted by spasm of the muscles makes one fragment slide upon the other, thus causing the shortening. The lower fragment has a tendency to rotate outwards so that the toes usually are found to be pointing laterally. First-aid treatment consists in giving treatment for shock and applying an outside splint as in fractures of the neck.

For permanent treatment an attempt at reduction must be made. This cannot be accomplished by one manoeuvre. The lower fragment must be pulled for several days so as to correct the overlapping, which is being maintained by muscle spasm. The simplest way of applying this pull is by means of a Thomas' splint and some adhesive plaster. A Thomas' splint consists of a loop of iron made of such a length that the whole of the leg can be contained within its limits. At the top is a thick padded ring. This ring is put over the foot and up the leg until it encircles the hip, the ring resting against that bit of bone behind on which the person normally sits. Two pieces of adhesive plaster each about 4 inches broad are then applied to the side of the leg reaching from the level of the fracture to just above the bones of the ankle. These latter must be carefully padded so as to prevent chafing by the strapping. The strapping is then joined over a small block of wood just under the sole of the foot. The block of wood should be about 3 inches square by $\frac{1}{4}$ inch thick and

have a hole in the centre. Through this hole a piece of strong rubber tubing is fixed and the other end tied to the end of the loop of the Thomas' splint. The rubber tubing is stretched so that its elastic pull gives the necessary traction to remedy overlapping of the fractured pieces. The weight of the limb is taken by cloth slings placed between the two bars of the splint and fastened under the leg with safety pins, as shown in figure No. 29.

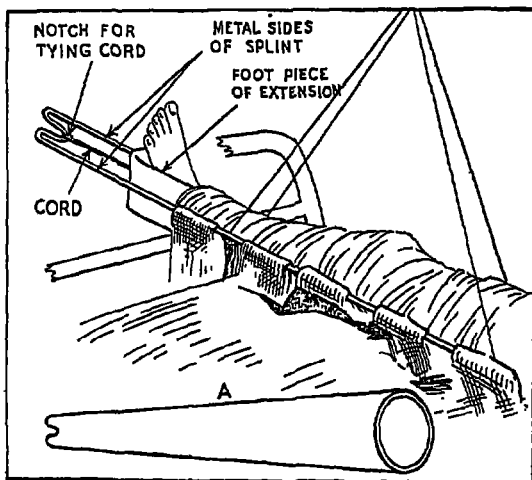


FIG. No. 29. A. Thomas' splint showing padded ring to fit the thigh, metal side pieces and groove on which to tie the extension cord.

To give some idea of the force that is required to correct overlapping it may be mentioned that the lower fragment is often pulled upon by means of a weight and a pulley. The weight applied is usually 40 to 50 lbs.

Having applied the Thomas' splint, strapping, rubber tubing and slings it will be found that readjustment is very frequently necessary. By applying pads of cotton wool and altering the position and tension of the slings, the position of the fragments can be very materially altered during the course of the first two or three weeks and as a rule the ultimate functional result of treatment depends very largely upon those adjustments. The tendency of the foot to rotate outwards should never be forgotten and it may be found necessary to bandage the foot to a separate upright by the

side of the Thomas' splint. The normal femur is bent so that the convexity points forwards and a little outwards. It is important that this convexity should be preserved especially in a case of certain artisans, *e.g.*, saddlers, shoe-makers, jockeys in whose work it is necessary to grip objects between the thighs. Maintenance of this normal curve can easily be obtained by pushing a few pads of cotton wool under the slings on the back and inner side of the thigh.

Powerful traction should be kept up for about 3 or 4 weeks. At the end of this time, the rubber tubing should be replaced by a piece of cord which is tied to the end of the splint fairly tightly so as to maintain the lengthening that the rubber tubing has won. The strapping may require to be renewed after a week or ten days, the pain of pulling it off a hairy leg is very much minimised if a little ether is poured on so as to dissolve the glue. It can be prevented altogether by shaving the leg before putting on the plaster.

At the end of about $2\frac{1}{2}$ months the patient may be allowed to go about on crutches with the leg splinted. Normal activity may be expected in 4 to 6 months.

Fracture of the lower end of the femur. These fractures are not very common, but when they do occur treatment is a matter of great difficulty. A powerful muscle is attached to the posterior aspect of the lower fragment. This piece of bone is therefore pulled so that it is more or less at right angles to its normal position. Reduction is very difficult. First-aid treatment follows on the lines of fracture of other parts of the bone.

Fracture of the knee-cap (Patella). This usually follows a very powerful spasmodic muscular action. The knee-cap is broken into an upper and lower piece, and the expansion of the powerful muscles on either side of it gives way also.

The patient is unable to stand and on feeling the knee-cap there is little difficulty in palpating the two fragments with a gap of $\frac{1}{2}$ -inch or more between them. Swelling of the knee joint and round about the fracture becomes very great, 24 hours after the accident so that it is then frequently difficult to make out what has happened.

A large pad of cotton wool extending for about 6 inches above and below the knee joint should be applied and a very firm bandage put on in a figure of eight fashion so that the two fragments, if not actually forced together are prevented

from separating still further. A short back splint completes the first-aid treatment.

As in a case of fracture of the olecranon process of the ulna a really good functional result cannot be obtained without operative interference. When the fracture is exposed at operation it is practically always found that the pieces are separated by bits of the surrounding soft tissues and blood clot. If these tissues are not cleared away and the bony fragments brought into apposition sound union will not take place. Further, the tear in the lateral expansion of the muscles round the patella must be stitched up, otherwise there will always be a good deal of weakness in the knee joint.

The alternative to operation lies in an attempt to force the pieces of the patella as close together as possible. The leg is immobilised with the knee absolutely straight, by applying a back splint which begins just below the hip and ends just above the ankle. A bandage is then applied under the lower fragment so as to prevent it slipping down. A horse-shoe shaped piece of strapping is then applied so that the upper fragment is in the hollow of the horse-shoe. The ends of the horse-shoe are then pulled downwards and applied either to the leg or to the splint. Care must be taken that the skin does not give way where it is pressed upon by the edge of the strapping in the hollow of the horse-shoe. If there is any tendency for this to occur the strapping must be removed and an endeavour made to keep the upper fragment in position by means of a transverse or a figure of 8 bandage.

If open operation has not been done attempts to move the knee joint should not be made for at least 2 months. If the period of immobilisation is unduly curtailed the inevitable weakness in the knee joint will be thereby very much increased.

Fractures of the bones of the leg. There are two bones in the leg, the tibia and the fibula. The tibia is the shin bone. It lies on the inner anterior side of the leg where it can be felt throughout its whole extent from the knee to the ankle. It is the bone that bears the weight of the body and fractures of it are very important.

The fibula is a long, thin, weak, irregular bone placed on the outer and posterior aspect of the leg. Its function is to provide a fixed point from which muscles can pull; it does not bear any of the weight of the body. At its upper

and lower extremities it can be felt lying just under the skin, but in the rest of its extent it is covered thickly by muscles. It is frequently fractured in association with the tibia, but a break of the shaft of this bone by itself is not important as it does not give rise to any disability and even at the time of the accident it does not cause much trouble. Fracture of the tibia usually occurs about the middle or lower part of the shaft, the fibula usually giving way at a different level. Figure No. 30 illustrates a fracture in the middle of the tibia with a bad result. There may be an angular deformity of the leg that makes diagnosis easy: but short of this the site of fracture can easily be ascertained by running the finger down the surface of the shin bone and feeling the broken

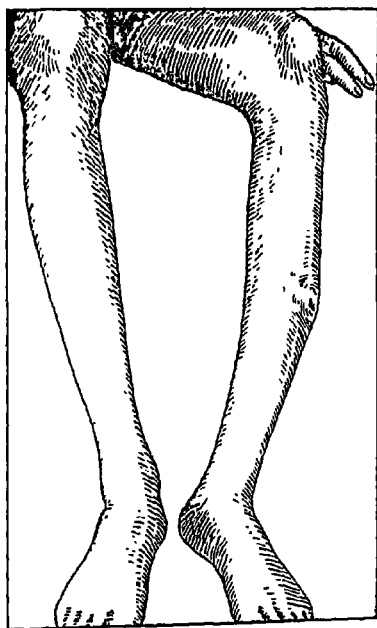


FIG. 30. There has been a fracture in the middle of the left tibia which has resulted in angular union. The patient was unable to walk because this gave him pain in the ankle joint.

ends. The line of fracture is generally oblique and the sharp end of the upper fragment is often driven through the skin so that the fracture is compound. The foot practically always falls outwards.

If the fracture is not compound from the beginning, it should be handled with extreme care so as to avoid making it so. This complication very frequently happens, because it is not realised how very close the tibia lies to the skin and that the upper fragment may end in a point that is shaped like and almost sharp as the nib of a pen.

If the patient does not volunteer the information that his leg is broken and indicate the site, careful inspection of the leg should be made before touching it. The position of the foot with relation to the knee (twisted out) and an angular deformity somewhere in the calf of the leg should put the observer at once on his guard. Before moving the leg in any way, it is wise to uncover it by slitting up the seam of the trousers and feeling the shin bone carefully. Having determined a fracture is present, splints should be got ready. The foot is then grasped and pulled downwards so as to undo the overlapping of the fragments and to minimise the risk of shooting the sharp lower end of the upper fragment through the skin. Still maintaining firm traction the foot is twisted inwards until the ball of the great toe, the inner side of the ankle and the inner edge of the knee-cap are all in one straight line. Two side splints specially well padded round the knee and ankle are then applied from the middle of the thigh to the sole of the foot so that both the knee and ankle joints are immobilised. Bandaging the two legs together during the journey to hospital is an additional source of comfort and safety to the patient.

If the fracture is a compound one and hospital is near, the best thing to do is to splint the broken bone without any attempt at reduction: the object being to prevent the condition becoming worse. A sterile dressing should be applied to the broken end of the bone.

For the permanent treatment of a simple fracture of tibia a box splint should be utilized. This consists of a posterior wooden splint that extends from the middle of the back of the thigh to just below the heel. It is slightly broader than the leg and at the bottom has a piece screwed on to it at right angles so as to support the foot. Opposite the heel the wood is scooped out so that the weight of the foot is not borne

by this piece of skin, which very readily ulcerates under pressure. The rest of the "box" consists of two side pieces that extends from the knee to the ankle and of a width such that they rest behind on the bed and in front project beyond the leg so that a bandage encircling the whole does not press on the front of the shin. These splints are very carefully padded, a specially large piece of cotton wool is placed in the hollow above the heel posteriorly. Large pads of cotton wool are placed on each side of the ankle and knee. Two pieces of bandage cloth are then tied firmly round all 3 splints enclosing the leg. The upper piece of bandage is placed about the level of the knee and the lower just above the ankle. A continuous bandage round everything from above the knee to the ankle gives further security.

In the absence of surgical aid, treatment of a compound fracture should be on the same lines except that the wound in the leg should be kept open for a week or 10 days by means of a small ribbon of boiled rubber. This is placed within the lips of the wound so as to prevent the skin healing and so allow free exit to pus if any should form.

Fractures of the tibia at the junction of the middle with the lower third frequently do not unite. For this reason prolonged immobilisation should be carried out especially if the fracture is a compound one. The patient should be kept in bed in his box splint for 2 or 3 months and if everything seems at the end of that time to be satisfactory he may be allowed a little liberty on crutches with light splinting.

Fracture of the leg bones immediately above the ankle. The most common type of fracture in this region follows a violent outward wrenching of the foot and ankle as a result of which the fibula breaks 3 or 4 inches above the ankle and the ligament on the inner side of the ankle is torn, from or with its attachment to the tibia. This is a Pott's fracture and unless it is properly treated it results in permanent lameness. Its seriousness lies in the fact that the ankle joint is more or less dislocated so that the weight of the body is thrown on the inner side of the foot instead of the outer as nature intended. The position of the foot, the site of the fracture of fibula, and the pain swelling, and tenderness on the inner side of the ankle, are, the main points which enable a correct diagnosis to be made.

For mere transport to a hospital a splint applied on either side of the leg will give all the support that is necessary. For permanent treatment the normal position of the bones forming the ankle joint must be restored. To do this the foot is grasped firmly, one hand holding the heel and the other over the dorsum. The foot is then pulled firmly downwards and twisted inwards until the sole is almost at an angle of 45 degrees to the line of its normal position. A splint is then applied to the inner side of the leg, reaching from above the knee to well below the sole. The upper end having been bandaged firmly in position a very large pad is placed between the splint and the inner side of the ankle joint. It is now possible so to bandage the foot to the splint that the "twisted in" position is maintained, the pad between the splint and the ankle acting as the fulcrum of a lever. The foot should be kept in this position for about 2 months. Every effort should be made to have an X-ray examination done within the first 2 weeks of the accident. The position of the bones will then be seen and any necessary correction can easily be made.

The other types of fracture in the region of the ankle joint are even more difficult of treatment and crippling in their after effects than the one just described.

Fractures of the foot. These fractures are usually the result of either a severe crush or a fall from a height in the standing position. The latter variety usually resolve themselves into a crush fracture of the heel bone (os calcis). This is perhaps the most difficult fracture in the whole body to treat so as to get a good functional result.

The foot is often crushed by weights falling upon it, with fracture of several bones as well as injuries to the skin and other soft tissues, resulting. Sometimes the foot is so crushed that it requires complete or partial amputation. Short of this, however, even when several bones are broken, a surprisingly good foot usually follows careful treatment. Displacement of the broken fragments is not very great as a rule and the wounds in the skin and soft tissues are what require most attention. When first seen these wounds should be very carefully cleansed of gross dirt and all tags of tissue that look devitalised, snipped away. The whole should then be covered with a hot fomentation. No attempt whatever should be made to control oozing of blood which assists in washing out contamination, a spurting artery is rarely

found in these cases. The fomentation should be changed in 2 or 3 hours and next day a dry sterile dressing applied. When the wounds in the soft parts are healed it is practically always found that the bones have united also.

Fractures of the Skull. These fractures are peculiar in the absence of the usual signs and symptoms of other broken bones elsewhere. Local pain and tenderness, abnormal mobility, crepitus, etc., are not prominent features. Further the fracture in itself is of little importance, except that it furnishes a very good idea of the force of the injury so that some conclusion may be drawn as to the extent of concomitant injury to the brain.

Fractures the vault of the skull usually take place as a result of direct violence. A piece of bone may be driven into the brain or the bone may be merely cracked with very little other damage. Fractures of the base are usually caused by *indirect violence*. The base of the skull is mechanically the weakest part and it frequently gives way in the region of the ear. After head injuries the ears should always be inspected and if blood or a watery fluid is found to be escaping a fracture at the base should be assumed to be present until it is proved otherwise. A similar escape of blood or water from the nose indicates the same probable cause. The ear and nose should never be syringed in such cases for fear of driving *sepsis* inside. The ear may be gently plugged: the nose should be left alone.

Concussion. Immediately after an injury to the head the patient may be stunned, *i.e.*, he is suffering from cerebral concussion. This condition is characterised by the following points:

- (1) It begins immediately after the injury.
- (2) There is paralysis of all the cerebral functions. He lies on the ground completely unconscious and limp. His limbs are flaccid and lie motionless in any position into which they are placed.
- (3) The pulse is feeble and rapid.
- (4) Breathing is shallow and of a sighing character.
- (5) The face is white and the skin covered with a cold clammy perspiration.
- (6) Recovery is rapid, and complete. It may be associated with a little vomiting and mental disturbance. The patient frequently forgets all about the accident.

If a patient has merely suffered from concussion the brain has not been in any way damaged. Thus no bad after effects ensue

If the head injury is of a rather more severe type so that the structures inside the skull have been damaged, the case is very much more serious. Immediately after the injury the patient has concussion as before. While concussion lasts the blood pressure is so low that bleeding from the lacerated tissues inside the skull does not take place. On recovery, however, the blood pressure becomes restored to normal, bleeding inside the skull now takes place, the blood pouring out of the ruptured arteries. This blood compresses the cerebral veins thus leading first to an impaired circulation of blood in the brain and finally to almost complete stoppage.

If these changes be kept in mind the peculiar history of some cases of accidents on the foot-ball field will be understood. A player struck on the head becomes unconscious. He is concussed. After a few minutes he regains consciousness and may insist on continuing the game. He has recovered from the concussion. He may then notice that one side of his body is becoming heavy and clumsy. He walks off the field and lies down in the dressing room. There he becomes gradually deeply unconscious. He is now suffering from *cerebral compression*. If he is examined carefully it will be found that his breathing is slow and laboured, often stertorous and accompanied with puffing movements of the lips and cheeks. The pulse is full forcible and slightly slower than normal. The face is not blanched and the skin is warm and of a natural colour. It is quite impossible to rouse the patient in any way.

If the patient is going to survive, expert surgical treatment is an immediate necessity. Speed is all important and the patient should be hurried to the nearest hospital without any attempt at elaborate first-aid treatment.

In the severest type of head injury short of immediate death the patient does not recover from the initial concussion. This merges into the insensibility of compression without the patient recovering consciousness. The chances of survival in such cases are not very good.

No case of concussion should be treated lightly. If a patient has lost consciousness or even felt giddy as a result of a blow on the head he should be made to lie down and must

on no account continue vigorous muscular exertion. Stimulants such as brandy should not be given as they increase the blood pressure which is the very thing that should be avoided, if there is any danger of cerebral compression. Hot coffee or tea is equally efficacious in reviving the patient and is not dangerous.

If after recovery from concussion the patient shows the slightest tendency towards again becoming unconscious no time must be lost. Immediate surgical treatment is necessary.

The severe cases of concussion should be treated by careful nursing in bed in a quiet darkened room. The head should be slightly raised and a cold compress applied to the forehead. Natural sleep should be encouraged. Perfect rest of body and mind will be necessary for a few days. An aperient should be given as this helps to relieve any slight oedema in the brain. A dose of salts is the best for this purpose.

Fractures of the spine. Where a patient has been involved in an accident in which it is possible he may have fractured his spine, it should be assumed that this grave injury has occurred and the patient treated accordingly. In fractures in this region the spinal cord very frequently escapes initial injury only to be crushed subsequently by the efforts of the by-standers to make the patient comfortable and remove him to hospital. Patients with a broken back are usually completely unconscious after the accident as they are suffering from concussion. Their muscles are therefore completely limp and do not in any way attempt to keep the broken pieces of the spine immobile.

Treatment of such a case is along the following lines. If suffering from concussion the patient should be left where he is until he has recovered consciousness. Meantime a stretcher or something that will serve as one (for example a door) should be procured, a few blankets, a pillow, drinks, hot water bottles, etc. The patient having regained consciousness is made as comfortable as possible where he is and no unnecessary movement of his body or legs should be made. The head may be propped up on a pillow, but otherwise the patient is best left lying on his back on the bare ground until he has fully recovered his faculties. When this has happened the stretcher should be placed lengthways at his feet. A strong blanket long enough to extend beyond

both the head and the feet is placed half rolled up by the patient's side. The patient's whole body is then very carefully rolled over this folded part of the blanket. Four or five people should co-operate in carrying out this manœuvre and every effort should be made to roll the patient in one piece and not twist his back in any way. The patient having been rolled over the blanket the folded part is then pulled out so that on allowing the patient gently to return to his former position on his back he is now lying on the blanket instead of on the ground. This manœuvre having been successfully accomplished and the patient none the worse for it, the edges of the blanket are seized by a sufficient number of helpers. Five or six on each side is a convenient number and one person should superintend the proceedings. In lifting the blanket it should be pulled not only upwards, but outwards, so that the patient lies on a surface which is somewhat flat instead of at the bottom of a deep narrow trough. Lifting should be done very slowly so that the man in charge can see if the blanket is being kept at constant level and that the patient's back is not being disturbed; if the movement is carried out slowly he can issue directions to pull more vigorously in one direction or another and so correct any tendency to deform the patient's spine. Having raised the patient sufficiently, the stretcher is then pushed under him and the sufferer then as carefully and gently lowered on to it. Narrow sand bags should be placed on either side of his body and legs so that he may be transported to hospital in safety.

If the spinal cord is crushed there is complete paralysis of the body below, and loss of sensation of all kind. The patient has no control over his bladder or bowels and is unconscious of their action. If the cord is merely pressed upon by a piece of bone or effused blood, recovery can take place if properly treated. In complete transverse section of the cord recovery is impossible. There is a great tendency even with careful nursing for the patient to develop bed sores. Septic inflammation of the bladder ultimately always ensues and death follows in 2 to 3 years usually as a result of spreading upwards of this inflammation to the kidneys.

Passing a male catheter. Immediately after the accident the patient is not only unable to pass urine, but is unconscious that his bladder is full. It is essential in every case of fracture of the spine to pass a catheter within 3 or 4 hours

if the patient has not himself emptied his bladder, as he may do if his spinal cord is not very badly injured.

A large soft rubber catheter should be used and must be passed with every aseptic precaution. The catheter itself must be boiled for 10 to 15 minutes and then put in a sterile tray ready for use. The operator washes his hands with soap and nail brush and running water for 15 minutes. The patient's penis is carefully washed with 1 in 2000 potassium permanganate and wrapped in sterile gauze only the tip remaining exposed. A bottle of glycerine or of sterile olive oil is got ready for use as a lubricant and the catheter smeared along its whole length. The penis is then picked up by the sterile gauze and the catheter pushed in care being taken not to allow it to touch any of the unsterile surroundings. No difficulty will be experienced in pushing the catheter into the bladder which will be reached in the male after about 8 inches of the catheter has disappeared. Flow of urine from the open end will indicate that the bladder has been reached. To make certain the bladder is empty, pressure on the lower part of the abdomen should be made after flow has ceased. For passing a catheter on the female *see* page 585.

It may be necessary to repeat the above operation 3 or 4 times pending the arrival of the doctor. The bladder must be emptied once every 4 hours during the day, the last thing at night, and the first thing in the morning. No slackening of the aseptic ritual can be allowed during those repeated catheterisations. Each must be done as carefully as the first otherwise the bladder will become septic and if the cord is damaged the sepsis will be permanent and may easily kill the patient.

Wounds of the scalp. Wounds of the scalp are important as they may lead to septic conditions in the brain and skull underneath. They should always be very carefully cleansed. If necessary the hair should be shaved off for an inch or two around the wound so that the latter may be thoroughly investigated. The blood supply of the scalp is very good and comes from the sides of the head. Thus large flaps of skin may be torn off and replaced without fear of their becoming gangrenous.

Blows on the head frequently result in a bruise with a good deal of bleeding under the skin. When seen a day or two after the injury an impression is often got that a circular disc of bone has been broken and pushed bodily into the brain.

This type of fracture practically never occurs and if it did the patient would be suffering from cerebral compression. The blood that has escaped into the tissues as a result of the blow spreads in a circular manner: at the edges it clots while in the centre it remains fluid. Thus the impression of a circular depressed fracture is obtained. These bruises do not require any special treatment.

Wounds of the throat. Wounds of the front of the neck are usually made with the intention of suicide. The wind-pipe and larynx are frequently cut, otherwise surprising little damage is usually done. The wound should be packed with sterile gauze which will stop the hæmorrhage if as is usual there are no spurting arteries.

These should of course be tied prior to packing the wound. If the larynx or wind-pipe is cut and the patient is breathing through the opening 2 or 3 thicknesses of gauze should be placed over it so as to prevent the entrance of dust, but not obstruct the air way. Precautions should be made to prevent further attempts at suicide.

Wounds of the tongue. The tongue is usually wounded by the patient's own teeth either during an epileptic fit or as a result of a fall. These wounds bleed very freely at first. The hæmorrhage is rarely severe and will stop by itself if left alone. The danger to the tongue should be remembered in treating a person in an epileptic fit, a very good method of preventing the accident being the insertion of a large cork between the teeth.

Wounds of the chest. The chest wall not infrequently sustains lacerated injuries in blasting or other such explosive accidents. A piece of stone or metal tears its way through the skin muscles and bones and makes an opening from the outside into the space where the lungs lie (the pleural cavity).

When seen immediately after the accident the patient will be found to be suffering from a mild degree of shock. His most distressing symptoms however are caused by the wound in the chest wall, which allows air to pass into the pleural cavity with every breath he draws. Sucking noises with each inspiration are heard. The patient seems to be fighting for his breath. He has an anxious strained look on his face and when asked questions replies only in grunting monosyllables as he has no breath to spare for idle conversation.

The wound should be immediately exposed and the skin flaps at the edges drawn together so as to block up the passage between the exterior and the pleural cavity. When this has been successfully done the sucking noise with each inspiration will immediately cease, and breathing in a short time will become very much easier. The skin flaps should then be held together by applying several pieces of adhesive plaster. A large square of gauze, several thicknesses deep, should then be impregnated with sterile vaseline and applied over the wound area. This will further ensure that the opening shall remain air tight. Some hot tea or coffee should be given and the patient dispatched at once for permanent surgical treatment.

Wounds of the abdomen. Blows on the abdomen from mule or horse kicks, as a result of accidents, or on the cricket and hockey field, etc., are not at all uncommon. The damage they do depends upon the force, the part of the abdomen that is struck, and the state of the organ, that lies immediately underneath. If the blow falls over the stomach or bladder these organs are very liable to be ruptured, especially if they are distended. On the other hand if they are empty practically no damage may be done other than the bruise to the abdominal wall itself. If the spleen is enlarged as a result of disease, *e.g.*, malaria, a very slight blow, so slight indeed that the abdominal wall may be scarcely even bruised by it, may be sufficient to cause rupture and death from internal hæmorrhage. In severer accidents, *e.g.*, the passage of a lorry wheel over the abdomen, death may be almost instantaneous. Sometimes however pieces of the intestine are crushed between the wheel and spinal column or a big artery may be torn, so that if immediate surgical aid can be procured the patient may still have a chance of preserving his life.

Whether the injury is of the milder or severer form does not very much matter as far as a first-aid worker is concerned. His duty is to lose no time in having the patient sent to hospital. He need not trouble about making an accurate diagnosis. This is frequently impossible even for the expert. Treatment in all cases is operative and with every hour that passes the patient's chances of recovery become increasingly less. Further it should be remembered that as the stomach may be ruptured even coffee or tea to drink may do the patient harm. On the other hand a pint of hot coffee run slowly

into the rectum is often of considerable benefit and is not very likely to do harm.

Wounds of the genitals. The male genital organs are liable to be injured while playing games or in being thrown forward on to the pommel of the saddle while riding. The patient may become unconscious for a few minutes or more usually feels very faint. After a little he usually becomes sick and may vomit. The pain is very intense and the patient holds himself in a doubled-up position. A stimulant like brandy should be given in the first place and the part enveloped in a large hot fomentation, the testicles being supported by a suspensory bandage. During the next few days pain and swelling are very considerable, but as a rule subside gradually and leave no bad after effects.

Wounds from frost-bite. Frost-bite is caused by exposure to extreme degrees of cold and comes on very readily in those whose circulation is feeble. The parts most frequently affected are the extremities, fingers, toes, nose and ears. The affected part may become slowly and painlessly waxy-white, the patient at the time being quite unaware that anything untoward is happening. In the course of the next few weeks the part becomes black and ulcerates off with or without suppuration. Short of being killed directly by the cold as described above, the part may be merely half frozen, but as a result of too rapid thawing it becomes very severely inflamed. A large portion may slough off, or a spreading ulcer may follow.

Treatment in the first place consists of restoring circulation to the affected part very slowly. The patient should be treated in a cold room whose general temperature is very slowly raised. Minute amounts of lukewarm coffee may be given during the recovery stage, but should be withheld until then. The part itself should be rubbed with snow first of all, then with cold water and only when the circulation has been re-established may warmer applications such as the attendant's hands be utilised. Any sores or ulcers which develop should be treated with bland aseptic dressings: dry sterile gauze is as good as anything. Healing is very slow.

Wounds from burns and scalds. A burn is an injury caused by dry heat; a scald by wet heat. In their after effects there is very little difference between them except that burns as a rule are localised, but severe: scalds being more diffused, but less in intensity.

Burns are classified according to their severity into six degrees. In the first the skin is merely reddened as in mild sun-burn. In the second blisters form; in the third the outer layer of the skin and part of the inner layer is destroyed. As, however, the inner layer is not completely devitalised and the lining cells of hair follicles sebaceous and sweat glands remain uninjured, this degree of burn heals perfectly. There is very little scar tissue and the skin over the burnt area becomes soft and supple. As the nerve endings are exposed the third degree of burns is one of the most painful. In the fourth degree, the whole of the skin and part of the underlying fat is completely destroyed. In the fifth degree, the muscles are also implicated and in the sixth, every thing down to and including the bone is devitalised, so that in a limb amputation is necessary.

The local changes in a burn may be described as taking place in three stages. (1) The stage of destruction the various degrees of which have just been described. (2) The stage of reaction in which the dead tissues are separated from the living. (3) The stage of healing. In the fourth degree of burn the raw area only very gradually becomes covered with skin which grows in from the healthy edges. As this is accompanied by very considerable scarring a greater or less amount of deformity almost always follows.

Immediately after the burn has been received the patient suffers to a greater or less extent from shock. In the wide spread superficial type of burn of the 2nd or 3rd degree that results from such accidents as upsetting a pot of boiling water over a child or the clothes touching fire, shock is so severe as to kill the patient. A burn of the 6th degree on the other hand, where confined to a limb, is very much less likely to be lethal.

During the stage of reaction the part is very likely to become septic, and even in the absence of this complication toxins, *i.e.*, poisonous substances, are produced from the dead tissues and absorbed into the circulation so that the patient is very ill. There is a special tendency during this stage for some complication like pneumonia to arise which still further prejudices the patient's chances of recovery. In the third stage when healing is taking place, in the absence of sepsis, there should be no constitutional disturbance; sepsis however is not infrequently present and the patient is exhausted by the length of his disease and convalescence.

He may be therefore in a very poor state to continue his struggle, and must be very carefully nursed.

Causes of death. Immediate death is usually due to suffocation from the smoke of the fire and poisonous gases. The patient may die within the first few days of shock or toxæmia. During the stage of reaction sepsis may prove fatal or some inter-current affection like pneumonia. If death occurs during the healing stage it is most likely to be from exhaustion.

The *treatment* of burns does not differ materially from the treatment of any other injury where the skin is broken. A burn may be looked upon as a contused wound and treated as such, the immediate danger being shock and the remote danger being sepsis.

When first seen the patient may be unconscious either as a result of shock or suffocation or both. If suffocation is a possibility, artificial respiration should be carried out as if it were a case of drowning. The general treatment of shock should also be carried out, as far as possible at the same time. In burns of the first degree a talcum dusting powder is all that is necessary. In burns of the second degree the blisters should be snipped away, a piece of sterile gauze wrung out in 2 per cent. picric acid, and bandaged to the affected part. Where a burn is very extensive, parts of the clothing may be stuck to the skin. Undressing will then be very painful and the stuck clothing should either be cut out or very gently separated by soaking thoroughly with water or oil until it comes away of its own accord. On no account may the skin be pulled with it. A minimum amount of pain is caused during the process of undressing in these extensive cases if the patient is immersed in a tepid bath, the temperature of the water being kept constant. The clothes can then be soaked off without haste and such gentle treatment helps the patient to recover from the shock of his accident.

In the worst type of extensive burns of the 2nd and 3rd degrees, a general anæsthetic is not infrequently necessary as a preliminary to undressing and to complete treatment of the local injuries.

In burns of the 4th, 5th and 6th degrees, treatment should be surgical. The dead pieces of tissue should be snipped away under a general anæsthetic, the wound dressed with full aseptic surgical precautions and the skin round about thoroughly cleansed. A blood transfusion may be necessary

to save the patient's life and his condition may be very much improved by intravenous administration of a pint of glucose saline.

Many fluids have been used in the treatment of burns. From the point of view of the first-aid worker perhaps most satisfactory is a 2 per cent. solution of picric acid. The picric acid may be kept in the form of a concentrated solution in alcohol and when required for use should be diluted with cold boiled water until it is of the requisite strength. In its absence sterile vaseline or boric ointment will serve the purpose as a preliminary dressing.

In the stage of reaction sepsis must be treated or prevented in the ordinary way. Whenever a piece of tissue is seen to be becoming white, i.e., forming a slough, it should be snipped away with a pair of scissors. Separation of the sloughs is often hastened by fomenting the part. If the burn is severe and the patient is confined to bed he must be nursed very carefully. General points like the care of back and the prevention of bed sores being carefully attended to and the special liability to pneumonia being kept in mind. The patient should be well wrapped up, have plenty of fresh air and sunshine should be propped up in bed as much as possible.

In the healing stage, if the burned part is near a joint, a tendency for scarring and disabling contractures may show itself. Thus if a burn is situated in front of the elbow, the joint should be kept straight otherwise healing will take place with a web in the crook of the elbow and an extensive plastic operation will be necessary before the condition can be cured. It is in the healing stage that a properly planned skin-grafting operation can be carried out with most satisfactory results. This should be kept in mind and if expert medical assistance has not for any reason been sought until the patient is well on the road to recovery, such assistance should be procured at this stage and may result in a normal limb for the patient at the cost of a trifling operation.

Wounds from lightning. Popular opinion to the contrary lightning stroke is not usually fatal. Frequently the patient does not even lose consciousness and may escape without even a burn. Lightning storms as a rule are accompanied by heavy showers of rain. If the person's clothing is wet the clothes take most of the shock and the wearer escapes. This however does not always happen and the person struck by lightning may

be killed: or he may be rendered unconscious and receive one or two local burns. The burns may be of a deep and obstinate character, or merely blistering of the skin may result. Similar shocks and burns may result from contact with insufficiently insulated electric wires. Occasionally the burns have an arborescent shape, a portion of the patient's skin looking as if it had a tree painted on to it. Other possible results are fractured bones, wounds like stabs, paralysis of a limb, loss of sight, speech, hearing or taste; recovery from these is the rule rather than the exception.

Treatment of lightning stroke is merely the treatment of shock and burns.

Wounds from drowning. The injurious effects of submersion in water may be varied. If the water is warm, the principal hurtful effect will be the suspension of respiration, or suffocation, but if, as is often the case, the water be cold enough to extract heat from the body, a very powerful depressing action or shock is added. Again, persons falling into the water may die from fright or syncope: or they may be stunned, if they fall from a great height, by impact with the water or striking a rock, pier, etc. Those who sink at once are usually effected in one of these ways. Artificial respiration has restored persons who have been completely immersed in water up to fifteen minutes. Absence of signs of life, if the body has been recovered within a reasonable time, must not negative immediate attempts at restoration. *Artificial respiration* then should be promptly resorted to and perseveringly continued. The following are the rules in the treatment of drowning. Send at once for medical assistance, blankets, and dry clothing, but proceed to artificial respiration instantly. Secure as much air as possible. The points to be aimed at are, firstly, restoration of breathing, and, secondly, when breathing is restored, the promotion of warmth and the circulation. To induce respiration (Schafer's method). lay the patient on his stomach and with his head turned to one side, so that his mouth and nose are kept away from the ground. If available, a rolled coat should be placed under the lower part of the chest. Kneel at patient's side and put your two spread-out hands, with the thumb nearly touching in the middle line of the back, over the patient's loins and lower ribs on each side. Press firmly with the weight of your body straight downward, thus pressing the patient's stomach against the ground and the air out of the chest. Do

not press too violently. Draw back your body while keeping the hands in position, and thus relax the pressure; in this way air will be drawn into the chest. Then pause and repeat the movements. Some fifteen complete, deliberate movements of this kind should be made per minute. The tendency is to make the movements too quickly. The movements must be persisted till natural breathing returns or until the pulse and breathing have ceased for at least an hour. Success has followed even after two hours' time.

When natural breathing recommences regulate the artificial respiration movements to correspond with it.

By Schafer's method the tongue naturally falls forward and fluids run out of the mouth. Fluids in the tubes of the lungs also are forced out and flow from the mouth.

A method useful in children and when the ribs are broken is the Laborde's method of artificial respiration, as described in the first-aid book of the St. John Ambulance Association, and is as follows: The patient is placed on his back or side, the mouth cleared of any froth or mucus by the finger; the tongue is caught hold of by the fingers, using a handkerchief to prevent slipping, and is then pulled forward for two seconds: it is then allowed to recede without losing hold of the tongue. These movements are repeated about fifteen times a minute. During the whole time the lower jaw should be kept well depressed.

While artificial respiration is being done, and without for a moment interrupting it, the following means should be employed to excite breathing:

Excite the nostrils with snuffs or smelling salts. Rub the chest and face briskly, and dash cold and hot water alternately on them. Friction of the limbs and body with dry flannel or cloths should be had recourse to while artificial respiration is in progress. Should a galvanic apparatus be at hand, apply the sponges over the heart and back of the neck.

Rectal injections of $\frac{1}{2}$ ounce of brandy or whisky to 2 ounces of hot water may be given every half-hour.

When a spontaneous effort to respire is perceived and becomes regular, cease to imitate the movements of breathing, and commence to induce circulation and warmth (as below).

Treatment after natural breathing has been restored. To induce circulation and warmth. Wrap the patient in dry blankets, and continue to rub the limbs upwards

energetically. Promote the warmth of the body by hot flannels, bottles or bladders or hot water, heated bricks, to the pit of the stomach, the armpits, and to the soles of the feet. When the power of swallowing has returned, a teaspoonful of warm water, small quantities of wine, warm brandy-and-water, or coffee should be given. The patient should be kept in bed and sleep encouraged. During reaction, large mustard plasters to the chest and below the shoulders will relieve the distressed breathing.

The patient should be carefully watched for some little time after regular breathing is restored : if any signs of failure in breathing are seen immediately resort to artificial respiration again.

CHAPTER IX

SURGICAL DISEASES

Abscess : Carbuncle : Cellulitis : Guinea Worm : Tongue.
Ulcers and Syphilis of the : Care of the mouth—Parotitis :
Toothache : Tooth extraction : Acute tonsillitis : Chronic
tonsillitis : Quinsy : Stomach and Duodenum, Ulcers,
Cancer and Pyloric obstruction of the : Intestinal obstruction
of the Children, Adults and Elderly : Appendicitis :
Anus, Prolapse, Piles, Fissure and Abscess of the : Gall-
stones : Kidney and Urinary bladder : Gonorrhœa : Syphi-
lis : Phimosis : Paraphimosis : Hydrocele : Varicocele :
Tuberculous Arthritis : Acute Suppurative Arthritis :
Bursitis : Bunion : Hammer toe : Flat Foot : Varicose
veins : Whitlow : Ingrowing toe nail : Deformities : Spine :
Lymphatic glands : Sarcoma : Cancer.

A SURGICAL disease is one that should be treated by surgical methods. These methods are difficult and for the most part should not be undertaken except by a surgeon. Before undertaking even a minor surgical operation not only is a knowledge of surgical technique required, but an accurate diagnosis which is even more difficult is absolutely essential.

First-aid treatment may have to be carried out by any one simply because he happens to be present when an accident has occurred. Similar first-aid treatment may be necessary in the treatment of certain surgical diseases, but as a rule these diseases are less dramatic and sudden in their onset, and so give warning that a serious condition is in process of happening and requires urgent expert assistance.

Here surgical diseases will be discussed with the object of enabling the reader to understand the nature and gravity of some of the more common varieties and the methods of treatment will be indicated. He will thus obtain some idea of the signs and symptoms for which he should look, so that he may be able to ascertain whether or not a patient is seriously ill and what should be done. In the initial stages of certain very serious surgical diseases especially of the intestine, the usual household methods of treatment may very gravely prejudice the patient's chance of recovery. The ordinary

treatment of any upset of the stomach, is a purge. If this gastric upset is due to an acute attack of appendicitis or to a strangulated hernia this treatment may result in actually killing the patient.

Mention will also be made of the prospect of cure of some of the more common ailments held out by modern surgery.

Some of the simpler surgical operations such as extraction of teeth, opening superficial abscesses, etc., will be described in detail. It is however very strongly urged that before carrying out even these simple operations, the operator should have seen at least once the same procedure actually carried out by some one with both knowledge and experience. Above all he must be sure his diagnosis is correct.

THE SKIN AND SUPERFICIAL TISSUES

Abscesses. The most common surgical disease of the skin and superficial tissues is an abscess. Abscesses can and do occur in any tissue in the body and are roughly divided into two varieties, acute and chronic.

(a) *Chronic deep abscesses.* A chronic abscess is usually tuberculous in nature and arises from some deeply placed structure such as a bone. It is very slow in its onset and may be completely painless and is usually accompanied by surprisingly little general upset such as fever. Sooner or later these abscesses come to the surfaces, i.e., the pus whose formation is the striking feature of any abscess, acute or chronic, burrows a way for itself to the skin. This track may be very tortuous and the pus very often bursts through the skin somewhere very far remote from the place at which it started. Thus, in tuberculous disease of the spine in the lower part of the back if left to itself, the abscess which forms will gradually push its way downwards so that the pus ultimately bursts through the skin somewhere in front of the upper part of the thigh.

It is most important that abscesses of this variety should be recognized as being chronic. It is an axiom in surgery "where there is pus let it out". But this does not apply to the pus of a chronic abscess. This pus contains a few or no living germs. It is not very harmful to the patient. If such an abscess is incised or allowed to burst, the skin wound may never heal. An opening is left through which matter pours for months. During these months the type of germ that causes acute inflammation is certain to gain an entry. This cross-infection as it is called is very serious and may well turn

a condition that was amenable to treatment by simple measures such as splinting and general rest into a grave illness that may cost the patient his life.

The general features by which such chronic abscesses may be recognised are these. The onset is slow and insidious. The general health undergoes a gradual change for the worse. If the temperature is taken carefully a slight rise in the afternoon or evening will be found: but fever is never a prominent early symptom. As has been mentioned before local pain may be completely absent and if present may be no more than a dull ache. The tissue in which these chronic abscesses very frequently begin is a bone or a joint. Where the bones of the spine are concerned a gradually increasing deformity consisting of the bending of the back and stiffness in the affected area will be observed. In other parts of the body stiffness of a joint or the gradually increasing disinclination to use a limb will be noted.

Chronic abscesses are so varied in their manifestation that it is impossible here to do other than to state their existence. This should be suspected when it is found that a soft painless swelling in a patient who is definitely not fit is gradually increasing in size. If the swelling is carefully watched it will be found to be gradually becoming bigger and in the most projecting part an area will become prominent in which the softness is extreme. The skin over this area will be found slowly to change its colour until ultimately it becomes a deep reddish purple. Left to itself in the centre of this reddish purple area a white spot will appear. The abscess will break through this spot and a large amount of brownish white pus will escape. Such abscesses should never be allowed to burst. Treatment of their underlying cause requires an accuracy of diagnosis that is quite beyond any except the expert.

(b) *Acute superficial abscesses.* An acute abscess in the skin and superficial tissues is often the result of an injury such as a bruise becoming infected by micro-organisms. These germs may gain their entry through a patch of eczema or by means of a tiny prick or scratch near the bruised area. The organisms settle down and multiply in the tissues, which react against their presence so that a state of inflammation is produced. The blood vessels in and around the part become dilated so that the part throbs: and because of the increased pressure from pouring out of fluids into the tissues pain is

experienced. The fluid that is poured out is of a kind that neutralises the poison of the germs and helps to kill them. The germs on their part invade the tissues and destroy the body cells in their immediate vicinity. This destructive process acts as a further stimulant to the blood vessels round about and to certain tissue cells which have been created by nature for the express purpose of fighting the enemies of the body such as germs. These cells helped by the increased blood supply attack the germs and kill them. The tissues which have been already invaded and devitalised are also acted upon, so that they become liquified. This liquid which consists of fluid that has been exuded from the blood vessels, dead germs, and dead cells, is the fluid we recognise as pus.

All these processes are of relatively rapid occurrence and are accompanied by pain, swelling, heat, and redness, in the affected part. The pain is of a throbbing character and is increased if the part is allowed to hang down. The patient is far from well during this time. His temperature may go up to 101 or 102, he feels hot, perspires a good deal, suffers from headache, is constipated, and has a foul tongue and nasty breath; his appetite is completely gone and he cannot sleep at night because of pain restlessness and general upset. This general upset is caused by the absorption of poisonous substances (toxins) from the abscess and will be relieved when the abscess bursts or when the pus is allowed to escape through an incision. Hence it is necessary to incise an acute abscess as soon as possible so that a minimum of toxins shall be absorbed into the system. Further, if the pus is examined by a bacteriologist live virulent germs will be discovered: so long as these are present there is always the possibility that the abscess will spread and this is an additional reason for providing an opening through which the pus may be drained to the outside when it can do no more harm.

Left to itself an acute abscess that has formed in the tissues just under the skin tends to break down and form an opening for itself to the exterior. The skin over the abscess is to begin with thickened hard and of a florid red colour. If it is felt it will be found to be hotter than the surrounding parts and to be very tender when it is pressed. An area in the centre of this florid skin will change colour in the course of a day or two so that ultimately it becomes white, i.e., the abscess "comes to a head". This white area is dead skin and under it will be felt liquid pus.

If the abscess has not already been laid open with a knife it can be done now without fear of hurting the patient in any way. The dead skin is absolutely insensitive and so long as the abscess is not pressed no pain will be experienced by the patient. The whole of the dead skin should be cut away either with the scissors or the knife so as to provide a free egress for the pus. A hot fomentation should be applied after the abscess has been opened and changed every two or three hours. The effect of the heat is further to increase the blood supply of the part and rapid healing ultimately depends upon a good blood supply. The moisture of the fomentation checks any tendency on the part of the pus to form a crust over the opening. Such a crust if it does form should be carefully removed with a pair of scissors or a dressing forceps as it tends to prevent free drainage. In every large abscess there is sometimes a tendency for the skin edges to fall inwards so as to block up the opening. If any such tendency is observed the opening should be kept patent by means of thin ribbon of rubber about $\frac{1}{4}$ to $\frac{1}{2}$ " broad put through the opening down to the centre of the abscess. The sole function of this rubber is to prevent the skin healing too quickly as it is sometimes inclined to do. So long as there is a discharge of white or yellow pus the piece of rubber should be kept in place. When the abscess is healing the discharge of pus stops and in its place there comes an ooze of clear transparent brownish fluid. This is an indication that there is now no necessity for attempting to keep the edges of the skin from healing. The rubber ribbon should therefore be removed and the best treatment that can be adopted is to put a sterile gauze pad over the part and leave it severely alone for a week or ten days. When the dressing is changed then it will be found that the redness, heat and swelling are completely disappeared and that the opening if not already closed is rapidly closing.

When the abscess is in its acute stages hot fomentation frequently changed helps to bring it to a head. A dose of salts should be given and the patient encouraged to drink bland sweet fluids such as tea, lemonade, etc., as much as possible. The fluids may be hot or cold according to the taste of the patient. The sugar in the fluids not only act as a food, but of great assistance to the liver, the organ that is most concerned in breaking down of the toxins absorbed from the abscess. The large amount of fluids help to dilute these toxins and to make their elimination from the body through

the kidneys, the skin and the bowels very much easier. The patient should be confined to bed if the abscess is at all serious and the part splinted, i.e., general and local rest should be given. General rest allows the body to concentrate all its energies on fighting the germs that have invaded it. Local rest by eliminating movement not only assist towards the same end but also very materially lessens absorption of toxins from the abscess and limits its spread.

(c) *Acute deep abscesses.* Difficulty in the diagnosis and treatment of a superficial abscess is rarely experienced. Where however the abscess is under the deep fascia and is far from the skin the local signs and symptoms may be somewhat difficult and the presence of pus may be suspected only because of local pain combined with fever, loss of appetite, thirst, constipation and all the other general symptoms that follow in the train of absorption of toxins from the abscess. If the collection of pus is in a dangerous situation such as in the neck as not infrequently happens it is most unwise for any one who has not a detailed knowledge of the anatomy of the part to attempt to make an incision. Without operative treatment such abscesses may be very dangerous, the patient will usually do quite well on local fomentation and the general treatment outlined above, for the better part of a week. Every endeavour must be made during this time to procure surgical assistance.

Carbuncle. A carbuncle differs from an abscess in that the infecting germs are so powerful that a large piece of tissue in the middle of the affected area dies. This piece of tissue becomes white in colour and has to be separated from its surroundings and removed before the carbuncle can heal. The general symptoms are very much more severe than those found in a simple abscess. The patient suffering from a carbuncle is frequently weak, anæmic and under-fed or suffering from diabetes, a disease which very much weakens the powers of resistance to germs. (See page 156).

The general local features of a carbuncle are precisely the same as those of an abscess except that the carbuncle has a tendency to be bigger and when it comes to a head and bursts the amount of pus discharged relatively little and the patient's fever, etc., is not very much relieved. This is because of the continued presence of the dead tissue in the middle of the inflammatory mass. This dead tissue is frequently referred to as the core or root of the carbuncle. The opening made by

nature is usually too small to allow the core to be extruded easily. The opening may with great benefit to the patient be enlarged with a scalpel and the core extracted by means of a pair of tissue forceps.

In really severe cases the toxins absorbed from the carbuncle may be so powerful that the patient will die if surgical measures are not taken for his relief. The patient may be completely unconscious and be in a state of low muttering delirium with a temperature of about 103. In such circumstances the best treatment is to cut the entire carbuncle completely out applying a large very hot fomentation to the bleeding surface that is left. Such radical surgery should be left to a surgeon. If his services cannot be procured and the patient's life appears to be definitely in danger two incisions should be made at right angles to each other. Each incision begins in healthy tissue at the edge of the carbuncle, goes through the centre of the inflamed area and finishes in healthy tissue at a point diametrically opposite to the beginning. The middle part of the incision must be of a depth such that the point of the knife is in healthy tissue. When the two incisions have been made, the four sectors should be separated from each other when it will be seen that under the florid skin is a mass of semi-solid brownish necrotic tissue. An incision parallel to the surface of the skin should be made through the middle of this necrotic mass each sector being taken in turn. Bleeding will be very profuse and alarming while this is being done but the operator must steel his nerves and go on. Attempts to stop the hæmorrhage are futile. If these incisions have been made as directed it will be sufficient to pack the wound lightly with gauze and envelope the whole with a hot fomentation. The wound should be dressed four hourly for the first day. Pieces of dead tissue will show themselves as white "sloughs" and should be snipped away with scissors. Dressing the wound will not be very painful and the patient's condition will rapidly become better with each dressing. The operation however causes a great amount of pain and if the patient is delirious he may have to be held down while it is being performed. No hesitation need be had in doing this as his struggles and cries are largely automatic and if the operation is not done he will probably die.

The patient's general strength should be conserved by the same methods as were detailed while discussing the general treatment of an abscess.

Cellulitis. In an abscess and a carbuncle the inflammatory process remains local. In cellulitis it tends to spread, and pus or slough formation are not a very marked feature. The general toxæmia however is even more severe than that found in the conditions previously described. Living organisms can readily be recovered from the blood and the popular if somewhat vague term of blood poisoning is peculiarly applicable here.

The local lesion shows itself as a very diffuse hard brawny swelling. The skin is florid in colour, very hot and may have, in the later stages, one or two whitish spots through which a thin serous pus is oozing in small amounts. From the edges red streaks and wheals are seen coursing upwards to the nearest group of glands for example to the groin in the case of a leg and to the arm pit in the case of the arm. The glands in these areas will be found to be enlarged, painful and exceedingly tender.

Not very much can be done in the way of local treatment other than the frequent application of large hot fomentations. General treatment is of much more importance and elimination of poison by the bowel, skin and kidney should be vigorously encouraged. Hot sweet drinks should be given in large amounts and even if the patient (as not infrequently happens) is in a condition of low muttering delirium, little difficulty will be experienced in getting him to swallow fluids as often as they are offered to him. If he is allowed to drink too much at a time there is a risk that a vomiting will follow. Therefore the glass should not contain more than 1 or 2 ounces. Such a quantity can be administered every 5 or 10 minutes without any fear of disastrous consequences. The skin should be encouraged to act by wrapping the patient well up in warm blankets, and surrounding him with numerous hot water bottles. Specific treatment such as the injection of anti-streptococcus serum and the doubtful benefit of surgical interference with the local lesion must be left to the surgeon.

Tetanus or Lockjaw. The germ causing this disease grows usually in the intestine of certain animals, *e.g.*, the horse and cow, and has to gain entry into the human tissues by means of a wound before the tetanus can be contracted. The germ is harmless if merely swallowed. Farm labourers working with heavily manured earth are very liable to be infected as a result of even small cuts about the hands.

If a sufficient number of germs find their way into the

tissues they grow and their poisons creep up the nerve trunks to the central nervous system. There the nerve cells are affected in such a way as to throw them into excessive and disordered activity. This shows itself as attacks of spasm in the muscles. At first the muscles in the neighbourhood of the wound are attacked, e.g., when the focus of infection is in the hand, the hand becomes stiff. Then the muscles of the neck and jaw become affected so that it becomes difficult to open the mouth. Finally all the muscles of the body become affected, those of the back perhaps most of all. Spasms become very prolonged and severe and follow the slightest attempt at movement, a touch or even a sound. In a typical severe spasm the patient's body is bent back so that he rests on his head and the corners of the mouth are drawn out; the respiratory muscles are in spasm so that breathing is impossible, and the face becomes first florid, then blue and finally black. Death takes place from respiratory failure, the patient remaining conscious to the last, suffering every pang of what is perhaps the most painful of all deaths.

Treatment in the first place is preventive and consists of thorough surgical toilet of any wound that might be contaminated with earth. It may be mentioned here that the practice of anointing the raw navel stump of a newly born baby with cowdung as is the custom of certain Indian people, is one that is not at all to be encouraged. Where contamination is feared, medical aid should at once be sought and an appropriate dose of antitoxin administered. This antitoxin neutralises the poison secreted by the germs and gives the body cells time to kill the latter, as they always do and so stop the manufacture of fresh poisons. The toxins already in the central nervous system are very little, if at all affected by the curative serum. Hence it is necessary to give the serum early before the poisons can arrive at their destination. Once the disease has manifested itself, the outlook is not very good even when the patient has every possible form of skilled treatment.

The Tongue. The sharp edge of a decayed tooth or the edge of badly fitting artificial denture not infrequently causes a deep ulcer in the tongue. Such an ulcer may reach a large size without very much pain, and because of the absence of pain nothing very much may be done in the way of treatment for quite a long time. Such an ulcer is always infected, so that the patient is continually

swallowing small amounts of pus. Ultimately the general health is bound to suffer and more serious conditions like ulceration of the stomach or duodenum may follow. Further there is a distinct tendency for those ulcers to become malignant. In other words they may turn into cancer. It should be realized that pain usually accompanies acute conditions; chronic ulcers, *i.e.*, ulcers that continue to progress for a long time are not necessarily very painful and this lack of pain is a characteristic of many conditions of long standing. None the less these conditions may be very serious and require treatment just as urgently as acute and more troublesome lesions.

The first principle of the treatment of any disease surgical or medical is to remove the cause. Where an ulcer of the tongue is caused by a sharp tooth or a badly fitting plate this should be corrected at once and the ulcer not allowed to become chronic.

The tongue is not infrequently attacked in the later stages of syphilis. A detailed description of the changes that may occur in syphilis will not be given here. It will suffice if it is remembered that a slowly progressive inflammatory lesion of the tongue unaccompanied by pain, but accompanied by a good deal of general foulness in the mouth, may be due to syphilis. The treatment of the tongue is the treatment of this disease.

Care of the mouth. In the nursing of any case surgical or medical, the tongue and mouth must always receive due share of attention. In many diseases there is a tendency for the mouth to become very dry and under these circumstances the germs that always abound here seem to become specially harmful. Saliva is brought into the mouth for the most part by ducts from glands outside. The germs seem constantly on the outlook for an opportunity to pass along these ducts and set up inflammation in the salivary glands at their ends. When a patient complains of his mouth being dry a glass of water is usually given him and he washes out his mouth. In doing so he seems to forget as a rule the space between his cheek and the outer part of his upper jaw. The duct of the chief salivary gland ("the parotid gland") opens here and this gland is very frequently found to become infected after a surgical operation if nursing is careless. With careful attention this should not occur, and if the nurse washes the whole of the mouth, including this region, with a 5 per cent. solution

of Bicarbonate of Soda and water, this complication need never occur.

The parotid gland is situated between the ear and the ascending part of the lower jaw. If infection does occur a tender swelling will be observed in this region. Hot fomentations should be applied and cleansing of the mouth carried out with special care.

In cases of dyspepsia or where the "stomach" has been upset sores are not infrequently found on the tongue. They are usually situated around the tip and on the edges and vary from small blisters to ulcers about $\frac{1}{8}$ of an inch in diameter. These ulcers may be very painful. They have a clean cut regular whitish margin, the base consisting of raw florid looking tissue.

A dose of salts has usually a miraculous power in curing these ulcers. A mouth wash of $\frac{1}{2}$ per cent. carbolic acid relieves the pain until the purge has taken effect.

The teeth. The teeth are made up of several different layers. One of these layers is exquisitely sensitive and when dental decay eats through this layer very severe pain is experienced. This explains the violent tooth-ache that comes on from time to time and then passes away. Tooth-ache is always accompanied by dental decay. For its temporary relief a tiny piece of cotton wool about the size of a grain of barley should be soaked in pure carbolic acid or oil of cloves. The pledget is then carefully placed inside the decayed cavity and covered by another pledget of the same size so that the drug with which it is soaked cannot come into contact with the tongue or the cheek. The two drugs mentioned have both the power of desensitising the sensitive layer of the tooth and of destroying it. The tooth-ache is therefore relieved for the time being and will not recur until the process of decay spreads so as to involve a fresh piece of the sensitive layer.

Besides causing pain dental caries may have other and even more baneful effects on the patient. Decay in a tooth is comparable to an ulcer elsewhere and it is due to septic infection and is accompanied by the formation of pus. This is swallowed and by many authorities has been considered to be the commonest cause of ulcers in the stomach, duodenum, gall-stones, etc. Further the pus may track down to the root of the tooth and cause an abscess there. From such an abscess toxins are constantly being absorbed. These poisons not infrequently seem to be the direct cause of rheumatic

conditions of the joints, pain in the back (lumbago) and inflammation of nerves (neuritis), neuralgia, sciatica, etc.

Dental surgery has now reached such a pitch of efficiency from a technical point of view that very frequently a tooth "has its nerve extracted" and crowned, that should really be extracted. It is possible to scrape out and clean a cavity in a tooth. If a dental abscess is formed, however, the only really effective treatment is extraction of the tooth. It is frequently difficult to be certain of the existence of such an abscess but a good X-ray picture may be relied upon to give the diagnosis.

It must be under exceptional circumstances that a non-medical man is now-a-days called upon to extract a tooth. The agonising pain of tooth-ache can be relieved fairly easily by such measures as have been already described. It is also unlikely that anyone not a dentist would ever be driven to attempt tooth extraction for any cause other than agonising pain. Further, it is more probable that a lay person will find himself in the possession of some carbolic acid rather than in the possession of instruments to extract a tooth.

Tooth Extraction.* Tooth extraction may be an easy or a very difficult operation. This depends upon the tooth to be extracted, the implements at hand for the purpose, and the skill, or otherwise, of the operator. When possible a dentist should be consulted. When the skilled aid of a dentist or doctor is not available, it is justifiable for a person of ordinary strength and ability to attempt extraction of a tooth when necessity, such as constant pain in a decayed tooth, demands that it should be done. The different sorts of teeth in the upper and lower jaws have different shaped forceps designed for their extraction. These forceps usually have stamped on them what teeth they are intended for. If such are available so much the better : if not, the operator must do his best with the forceps at his disposal.

The operation of tooth extraction may be described in three stages :

(1) The application of the forceps to the tooth. (2) The destruction of the membranous connexions between the tooth and its socket. (3) The removal of the tooth.

The instructions here given first are applicable to all teeth.

*For Figs. 34 and 35 in this section and for much of the letterpress we are indebted to M. Coleman's book on "Extraction of Teeth" published by H. K. Lewis.

After that description a separate short account will be given for the different kinds of teeth in the two jaws.

(1) In the first stage, the forceps should be taken in the palm of the hand, the blades pointing upwards or downwards, according to the jaw operated on, the thumb being employed as a stop or regulator to govern the amount of separation of the handles, and consequently of the blades, as shown in Figs. 31 and 32.

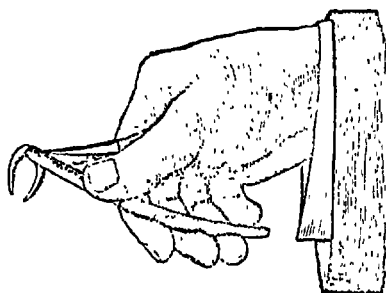


FIG. 31. Showing method of holding Lower Forceps.

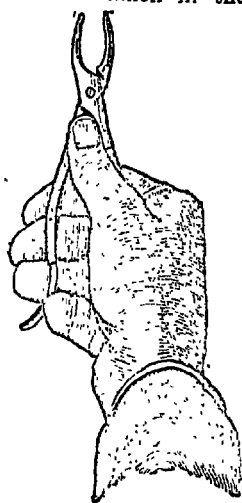


FIG. 32. Showing method of holding Upper Forceps.

The blade should be first adapted to the most obscured side of the neck of the tooth, and then lightly closed upon the opposite side. This being done, the thumb is gradually withdrawn, and steady, but forcible pressure made in the direction of the root of the tooth. The force employed should be *regulated* by the amount of resistance experienced, it being applied gently and increased as the case demands, and often accompanied to advantage by a very slight rotatory movement.

The tendency is to force the blades insufficiently up the socket of a tooth, and so to obtain only an edge grasp on the neck of the tooth, with the probable result of fracture at this point. If the tooth be already loose, and specially if it be one with a single root, there is no need to push the blades up the socket to any extent, and doing so only causes unnecessary pain.

In any case one should commence gently and gradually to increase the force until a *firm grasp* of the tooth is obtained.

(2) The second stage of the operation, the separation of the tooth from its socket, is now begun. This will consist in a slight rotatory movement, if the tooth has a conical root, or an

inward and outward movement, if the root be flattened, or if there are two or more roots. The hand is able to perceive when the membranous attachments of the tooth to its socket have yielded, and then the operator begins continuously with this stage the movements of

(3) The third stage or stage of extraction. Care should be taken not to apply this force too soon, *i.e.*, until the last stage is complete, or great resistance will be experienced, and fracture of the tooth may occur.

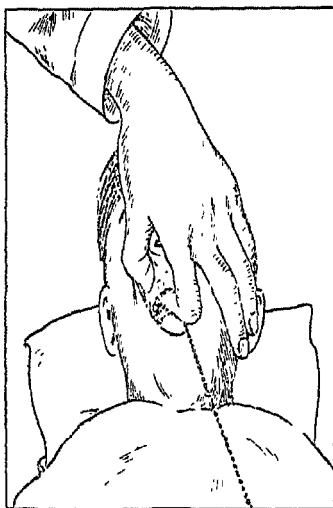


FIG. 33. Showing position of fingers of left hand for removal of a right upper bicuspid or molar.

One can tell, as a rule, in what direction the loosened tooth is coming most readily, and the traction should be exerted in the direction of least resistance. It should be understood that all the time the forceps must be held tightly, grasping the neck of the tooth; no movement between the forceps and the tooth itself is allowable once they have been applied.

In all extracting, the left hand must be used to support and steady the jaw as shown in Figs. 33 and 34.

Upper Front Teeth. The forceps, held as before directed, should be applied to the neck of the tooth, to its posterior surface first, and then closed gently upon it by the thumb

being withdrawn. The instrument is now forced upwards in the direction of the long axis of the tooth until the edge of the jaw, or, if the tooth be much decayed, a point beyond, is reached. As a rule at least *a third of the root* should be in the grasp of the forceps.

The tooth being firmly grasped, slight rotation in one direction is attempted ; but if much resistance be encountered the rotatory movement is reversed, and if still resisted, it may be exchanged for an inward or outward one—*i.e.*, to and



FIG. 34. Showing position of fingers of left hand for removal of a front left lower tooth.

from the centre of the palate—coupled with a return to the rotatory movement. An inward movement often immediately loosens the tooth.

Upper Side Teeth or Bicuspsids. As already described, the instrument is applied to the tooth, and the blades forced upward into the socket. The tooth is to be separated by movements to and from the palate, first inwards towards the palate, then more forcibly outwards. Rotation is not to be performed on side teeth.

Upper Molars. These teeth have three roots. In removing a tooth of such dimensions and resisting power as a molar,

we must exert a larger amount of force than upon smaller and less firmly implanted teeth, and this especially in grasping them, when a very slight rotatory movement accompanying the forcing upwards of the instrument will often prove advantageous. From the direction of the roots, it is apparent that only an inward and outward movement is feasible, commencing with the former.

The lateral movements have generally to be repeated before the truly extractive ones can be attempted. A slight rotatory movement when the tooth is fully brought outwards will frequently readily disengage it from its socket. This slight rotatory movement has the effect of dilating a tooth socket and unlocking a curved root.

Lower Front Teeth. The operator should stand on the right and slightly in front of the patient; the jaw is grasped on the outer and inner aspects by the thumb and first finger respectively, whilst the remaining fingers support the lower jaw. A clear view of the tooth operated upon is by this means obtained, as the thumb likewise depresses the lip and the first finger pushes aside the tongue (Fig. 34).

The instrument is pressed well down into the tooth socket and the severing or detaching movements, which should be inward and outward, are cautiously performed. These teeth yield most readily in the outward direction, in which, combined with an upward direction, the final extractive force should be exerted.

Lower Side Teeth or Bicuspid. The operator stands behind and slightly to the right of the patient in removing a right lower bicuspid. His left arm passes round the patient's head, and his thumb and first finger embrace the inner and outer sides of the jaw respectively, the remaining fingers supporting the jaw. If detachment be felt after the first movements, the rotatory can be combined with slight lateral movements.

Lower Molars. These teeth have two roots, flattened and curved slightly backwards. The operator should stand in the same position as that recommended for lower bicuspid, employing the left hand in the same manner (see Fig. 34). Slight inward movement may first be attempted, but the tooth will generally more readily yield in the outer direction.

The pain produced by extraction will be reduced if the gums are painted with a 10 per cent. solution of cocaine, or one of its allied substances.

The tooth forceps should always be scrupulously clean and should be sterilised by boiling before each operation. After extraction the mouth may be washed out with Prescription No. 20 or glycothymoline and water. Should bleeding continue for long from the socket, a doctor should be consulted.

The Throat. The tonsils are frequently the site of acute and chronic inflammation.

Acute tonsillitis may occur in children or adults but usually the former. The onset is fairly sudden. There is pain in the back of the throat especially on swallowing which may be so difficult that saliva is allowed to dribble out of the mouth. There is usually a considerable amount of constitutional upset. There are mild fever, constipation, vague pains in the back, head and limbs and general malaise. The neck glands especially those round about the angle of the jaw are enlarged and may be very painful.

Large hot fomentations frequently renewed should be applied to the neck and the patient should gargle his throat and wash out his mouth frequently with warm 2 per cent. carbolic acid or 5 per cent. potassium chlorate. The condition as a rule subsides in a few days, but has a tendency to recur from time to time or becomes chronic.

Like most chronic conditions chronic tonsillitis is not necessarily a painful condition. It is however none the less one which may be sufficiently serious to warrant radical treatment, *i.e.*, excision of the tonsil. The chronically inflamed tonsil when examined after excision will be found to have several small abscesses deep in the substance communicating with the surface by means of small inflamed tracks full of pus. This pus is constantly being swallowed and the poisons elaborated in the abscess are constantly being absorbed.

Acute tonsillitis as a rule occurs in children. A single attack if not repeated is not serious. Repeated attacks however end in chronic tonsillitis. The child's health is very gravely affected as a result of his repeated illness. If the tonsils are not removed a period usually arrives during adolescence when he no longer suffers from frequent sore throats. Trouble however is merely being postponed and the wisest course is still to have the tonsils removed.

A quinsy is an acute abscess at the back of the throat. Chronic abscesses due to tubercle of the bones of the neck also occur in this situation. Confusion between these different types of abscesses will not occur if it is remembered that the

chronic abscess is very slow and gradual in its course, is practically painless, is accompanied by stiffness of the neck and prolonged general ill-health but without very much fever. A quinsy on the other hand comes on quickly taking only a day or two to develop: there is rapidly developing difficulty in swallowing, and perhaps difficulty in breathing. The condition is very painful, pain being referred to the back of the throat, the root of the tongue and the upper part of the neck. Fever, and general upset is fairly well marked. The patient can open his mouth only with great pain and difficulty and only for a very little distance. It is almost impossible to get a good view of the back of the throat.

Left to itself a quinsy will burst into the throat and mouth with almost immediate relief of all the symptoms. This happy termination can be anticipated by a wisely planned and carefully carried out incision of the abscess. Treatment otherwise is the same as in tonsillitis.

The Stomach and Duodenum. After the food has been swallowed it passes down the oesophagus (gullet) into the stomach which is a large reservoir whose main function appears to be a preliminary breaking up of the food and allowing it to escape in small quantities into the duodenum where digestion is carried a stage further. The duodenum is a short and very much curved part of the bowel; in it the digestion proper is really begun and into it pour the digestive juices of the pancreas and liver.

Ulcers occur in both the stomach and duodenum and are a frequent cause of chronic indigestion. Food, pain, vomiting, relief, in that order indicate the presence of a gastric ulcer. Pain, food, relief indicate a duodenal ulcer. A duodenal ulcer may be of very long standing, 20 years or more. Like a gastric ulcer the symptoms it causes may disappear entirely for months on end without any treatment only to recur perhaps with increased intensity. Heart-burn and acid eructations are frequently symptoms of both, especially of ulcer of the stomach.

Treatment in the first place is medical, *i.e.*, by dieting and medicines chiefly alkalies and bismuth. If medical treatment fails surgical measures are indicated. For the treatment of certain complications of such ulcers surgery holds out the only prospect of cure. The most dread of these complications is perforation, *i.e.*, the ulcer eats its way through the wall of the gut so that the contents escape. This happens as a rule with dramatic suddenness. The patient has a sense that something

has given way inside his abdomen. He is struck down with an attack of abdominal pain so severe that he may collapse, doubled up on the floor, and be incapable even of speech, for a short time. When he recovers somewhat it will be seen that his abdomen is fixed, i.e., it does not move on respiration as in normal person. On examination it will be found that the muscles of the abdominal wall are rigidly contracted and have been compared not inaptly to a board.

If surgical intervention is possible within 12 hours the patient has a very good chance of recovering. With every hour that passes after this time, his chances become steadily fewer. Pending the arrival of a surgeon, very little can be done. Large fomentations covering the entire abdomen will give a meagre measure of relief to the patient's agony, otherwise he should be left severely alone.

The ulcer in the stomach or duodenum may eat its way into an artery. Where an artery in the stomach is involved the patient vomits large quantities of bright red blood. The condition is a most alarming one but is very rarely immediately fatal. The patient should be put to bed immediately, and treated by masterly inactivity. Nothing whatsoever should be given by mouth. If thirst is very distressing a pint of water may be slowly run into the rectum. If the patient is restless, a hypodermic injection of $\frac{1}{4}$ grain of morphia should be given otherwise he should be kept at absolute rest so that his blood pressure may fall and assist the hæmorrhage to stop naturally as it will always do.

One attack of bleeding from a gastric ulcer may be amenable to treatment by non-operative measures. If however the attacks are repeated surgical treatment is usually necessary.

In the case of a duodenal ulcer, eating its way into an artery, the blood is not vomited, but passed in the faeces where it appears as a black, tarry substance. If much blood is lost suddenly, the patient collapses, becomes very pale, the pulse rate increases and in severe cases he becomes very restless in bed, finds difficulty in getting enough air into his lungs and feels very sick, without vomiting. These are the general signs of loss of blood and are always danger signals. Treatment is on the same lines as that for hæmorrhage from gastric ulcer.

In people of 40 years of age or over where digestive troubles with the symptoms of gastric ulcer suddenly develop, i.e., come on in a few months, the possibility of cancer of the stomach, especially in men, should be kept in mind. This

disease in its early stages is amenable to surgical treatment, but only too often the patient postpones consulting his medical adviser until it is too late.

The opening between the stomach and duodenum is termed the pylorus. This opening may be closed as a result of ulceration in this region so that the patient vomits everything he eats and as a result suffers from slow starvation. Usually such people vomit every second or third day very large quantities of dirty fluids in which they can recognise food particles that were eaten perhaps two days previously.

In children within the first two or three weeks of birth, this opening is sometimes closed because of an abnormal state of the muscle round about it. The prominent feature in such babies is repeated projectile vomiting, *i.e.*, the food (milk) does not merely regurgitate but is brought up forcibly so that it is actually squirted out of the baby's mouth. To save the little patient's life, an operation is usually necessary within 7 to 10 days of the onset of the symptoms.

Intestinal Obstruction. The small intestine is a tube some 22 feet long in which the food is digested and absorbed. The large intestine is the lower part of the alimentary canal, it is about 5 feet in length and in it the food residue and debris of small intestine is prepared for excretion as faeces.

The intestinal tube is not infrequently blocked from mechanical causes so that the contents in the part above the block are dammed up, and can no longer pass on from the small intestine into the large intestine, or from the large intestine to the exterior as faeces. It is impossible here to give all the varieties of intestinal obstruction or to give a surgically accurate classification.

In children of about a year old acute intestinal obstruction is usually caused by a condition in which a part of the bowel above becomes folded inside the bowel below (intussusception). This condition appears usually to occur in particularly flourishing male children who are just being promoted from liquid to solid diet. The child becomes acutely ill, is doubled up with abdominal pain, the pain coming on in spasms lasting a few minutes at a time and then passing off. There may be a little vomiting to begin with, and the lower bowel may at that time be empty. Afterwards neither faeces nor wind is passed, but as time goes on a little blood may appear or a piece of the bowel itself in the later stages may be seen projecting through the anus.

Treatment is surgical and immediate. Pending the arrival of a surgeon, the child should be left absolutely alone. If the anxious mother feels she must do something, hot fomentations on the abdomen frequently renewed may be applied. On no account should a purgative be given.

In adults perhaps the most frequent cause of acute intestinal obstruction is a strangulated hernia. There are various weak points in the abdominal wall through which a loop of bowel can force itself when a violent muscular effort is made. Two of these points are situated in the fold of the groin. One of these openings, the femoral canal, is on the inner side of the main vessels of the thigh. The other is especially large in the male being formed by the descend of the testicle from the abdomen to the scrotum during prenatal life, and in the adult giving passage to the vessels, nerves and duct of the testis; it is called the inguinal canal. A piece of bowel finding its way into these regions forms a femoral, or an inguinal hernia respectively. The former is more common in women, the latter in men. These sites should always be examined if some violent exertion is followed by a sickening pain in this region perhaps a little vomiting, colicky pain in the abdomen and after perhaps one motion complete stoppage of both faeces and gas. Left to itself there will be regurgitation of matter that looks and smells like faeces. This is a sign of impending death and surgical aid should have been procured long before it became manifest.

In the early stages it may be possible for trained fingers to replace the prolapsed loop of bowel into the abdominal cavity by manipulations from outside. There are so many dangers and contra-indications to such manipulation that they are best left alone and nothing whatever done pending the arrival of a surgeon.

In the aged, acute intestinal obstruction is usually the result of cancer of the large intestine. The patient suffers from gradually increasing constipation unrelieved by purgatives. The condition progresses until one day the bowel refuse to act and gradually the signs of acute intestinal obstruction become evident. In these cases, there is a marked tendency on the part of the patient's attendant to administer repeated dose of castor oil which is the worst thing possible. Treatment is surgical and the sooner an operation is performed the greater are the chances of survival.

Appendix. The vermiform appendix is a tube 1 to 10 inches in length open at one end and closed at the other. The closed end in prenatal life, at one stage, was the beginning of the large intestine. As development proceeds the appendix grows very slowly so that in the adult its diameter is about that of a lead pencil while the part of the large intestine into which it opens (the cæcum) is about 2 to 3 inches wide. In European, of all ages, inflammation of the appendix is very common but especially in young adults.

The symptoms of an acute attack of appendicitis are pain, fever, vomiting, abdominal tenderness and rigidity. The pain is usually vague to begin with situated more or less round the navel. It may shift somewhat from time to time, but ultimately becomes fixed in the lower right side of the abdomen about the middle of a line connecting the umbilicus with the prominent bony projection at the outer end of the fold of the groin. The fever is not very high, the temperature being 101° or 102° , but the pulse rate is much increased about 120' being not unusual. Vomiting is not very profuse as a rule and consists of the stomach contents and perhaps a little watery bile-stained fluid. When the pain becomes definitely situated on the right side the patient complains of tenderness when this area is pressed and the abdominal wall will be felt to harden in resistance to the examining finger. The rest of the abdomen is soft. Treatment is immediate operation. A purgative is the worst thing possible. Left to itself the inflammation may subside, probably to recur later; or an abscess may form walled off from the rest of the abdominal contents. The abscess may become absorbed, especially if the patient is treated by rest in bed and absolute starvation, minute sips of water being given by mouth only if very great thirst becomes distressing. The abscess, however, may burst, so that the pus is spread all over the abdomen perhaps with a fatal result in spite of surgical help.

In one form of appendicitis the lumen is blocked, distal to the obstructed point the appendix becomes distended with fluid. Severe colicky pain is felt as the appendix attempts to overcome this obstruction. Failing to do so it ruptures with a relief of pain to the patient. This apparent amelioration has caused many deaths. The patient's condition becomes steadily worse and his pulse rate and temperature rise. The infected contents of the ruptured appendix spreading inside the abdomen cause general peritonitis which kills the patient.

A word of warning about the misuse of aperients may be not out of place here. There seems to be in the lay mind an idea that a dose of medicine, if it will not cure every abdominal complaint, is a necessary preliminary treatment and in any case can do no harm. This is absolutely wrong. Purgatives should not be used indiscriminately. The lay person would be very well advised to refrain from giving a purgative to any one suffering from an abdominal disease of an unknown nature. Appendicitis has many modes of onset; vomiting may be due to acute intestinal obstruction, constipation may be caused by cancer. In such conditions domestic remedies are not merely impotent, but may do very grave harm and should therefore be used with extreme caution.

The Anus. In young children and in the aged prolapse of the bowel through the anus is not at all uncommon. The prolapsed portion is quite small as a rule not more than $1\frac{1}{2}$ " to 2" in length, the anus is surrounded by a circular muscle, the sphincter, and in cases of prolapse this muscle is found to be abnormally loose and thus permits the protrusion.

In children prolapse usually follows an attack of diarrhoea where straining has been excessive. The piece of bowel appears at the opening as a pinkish red mass about the size of an almond. It is quite healthy looking, does not bleed and does not appear to be either very tender or to cause very much pain. Treatment consists of applying a cloth wrung out in very hot water to the part. This will cause the muscle in the bowel wall to contract so that the prolapsed portion becomes pulled back into its proper place. The hips should then be kept together by means of a piece of strapping and the bowel attended to so as to avoid either constipation or diarrhoea. The strapping need not be kept on for more than a day. The tendency is for complete and rapid cure to be permanent.

In old people prolapse of the bowel is usually a symptom of chronic constipation treated by violent purges which cause a great deal of straining. The bowel is easily replaced in the same way as in children, but as the condition tends to recur the prolapsed part not infrequently becomes inflamed and ulcerated. Further, there may be some condition inside the rectum (the lowest part of the alimentary canal) which induces prolonged straining at stool. A thorough investigation of the case should therefore be carried out. The immediate treatment follows the same lines as treatment for piles.

The most common of all diseases of the anus is piles. There are two varieties of piles, internal and external. The internal variety lie inside the anal canal and cannot be seen from the outside unless they are prolapsed. The external variety lie outside just at the place where the skin joins the lining of the end of bowel. Each pile consists of a little bunch of varicose veins. The veins in this region are thin walled and very poorly supported by the tissues round them. The blood inside them is carried back to the heart partly *via* the liver (portal circulation) and partly directly. As the blood may flow in either of those directions the veins have no valves like veins elsewhere, thus they are specially liable to feel the effect of any impediment to the return of venous blood to the heart. The pressure inside them becomes increased, they dilate, become varicosed and piles result. The most common cause of piles is constipation. Cirrhosis of the liver, abdominal tumours, pregnancy, heart disease and many other causes may operate and a patient suffering from piles, especially if of rather rapid onset should never rest content with treatment of the local condition without investigation of the underlying cause.

External piles are practically symptomless until the blood inside the veins clots as the result of some superadded inflammation which may be caused by injury. The part then becomes painful, hot and tender and itchiness may be very distressing. On examination, two or three dark purple almost black swellings of an inch in diameter will be seen round the anus. Treatment aims in the first place at curing the inflammation and repeated hot hip baths usually give great relief. Any concomitant upset of the bowels should be treated and the patient instructed to wash the part after defaecation instead of using toilet paper. If these measures are ineffective surgical advice should be sought.

The chief manifestation of internal piles is bleeding. This usually comes on during evacuation of the bowels. The hæmorrhage at first is symptomless, the patient being aware of having passed blood only because he sees it. Bleeding occasionally starts at odd moments for no obvious cause. The amount of blood lost varies and may be sufficiently great to make the patient very weak. Left to itself the condition does not tend towards spontaneous cure as a rule, so that at the end of a few months the sufferer may be profoundly anæmic. The piles inside become bigger and ultimately may

prolapse. The prolapse is easy to replace to begin with, but later, reduction becomes more difficult and eventually a pile-bearing mass of mucous membrane may prolapse and become tightly squeezed by the muscle around the anus so that it cannot get back. Inflammation and ulceration of the piles is then a further complication.

As in the treatment of external piles any irregularity of the bowel must be corrected, the cause of the piles found and if possible removed. As a local application chlorotone ointment or the old fashioned gall and opium ointment may be used. The parts should be kept scrupulously clean and any local irritation avoided.

In the early stages before internal piles have become inflamed and ulcerated, the modern method of treatment by injection is most satisfactory. The injected fluid makes the pile shrink until it practically disappears and bleeding stops at once. The injection is not painful, but a good deal of discomfort may be caused in passing an instrument up the anus so as to enable the surgeon to see what he is doing. This method of treatment has a further advantage that while it is being carried out the patient need not curtail his normal activities. It is however not satisfactory in neglected cases for whom operative treatment offers the best prospect of cure.

An *anal fissure* is perhaps the most painful and distressing of all the diseases that occur in this region. A fissure is a shallow ulcer, the upper end of which is in the anal canal and the lower end just at the exterior. The lower end is marked externally by the presence of a heaped-up piece of skin, mucous membrane and inflammatory tissue termed the "sentinel pile". In the upper part of the anal canal are a series of folds of the lining membrane called valves. These valves are liable to injury by hard masses of faeces. Such a hardened mass may tear one of these valves and a fissure results. As a rule a fissure is single and situated posteriorly. If more than one fissure exists thorough investigation of the case is necessary as some such disease as Syphilis may be the cause. Typically a fissure causes intense pain during but especially after defaecation. The pain is so intense that the patient is afraid to allow his bowels to move. The pain is of stabbing character and is referred to the hips and backs of the thighs as well as to the region of the anus. A few drops of blood may accompany defaecation, but hæmorrhage is not a feature.

This condition is not amenable to medical remedy. Local

warmth by means of fomentation, hip baths, etc., relieves the pain temporarily as also does regulation of the bowel. For permanent cure surgical intervention is necessary.

In the region of the anus abscesses of various kinds occur such as *fistula-in-ano* and *ischio-rectal abscess*. Their presence can scarcely be missed as a patient has an opening near the anus discharging pus. Left to itself such abscesses tend to spread. Eventually the skin round the anus may become thickened and excoriated as a result of chronic inflammation and several apertures will be found discharging pus. Early surgical intervention is necessary to prevent the spread of the inflammation. If the latter is allowed to progress an incurable condition may result.

The Liver. The liver is one of the most important glands in the body. Its functions are many and varied amongst others being the work of metabolising fats and the excretion of bile pigments. Gall-stones result from some error in the disposal of these substances. One of the products of metabolism is cholesterol. During pregnancy this substance is stored up in the body in huge amounts. Thus cholesterol gall-stones are very frequently found in women of about 40, who have had many children in rapid succession. Sepsis and the deposition of bile pigments seem to be added factors in the formation of gall-stones, but all the factors are not known.

The gall-stones that cause most trouble to the patient are formed in the gall-bladder, an appendage of the liver in which the bile is concentrated. Chronic indigestion with a great deal of flatulence and belching especially after a meal in which pastry has figured are the most prominent symptoms. Little attacks of jaundice may occur from time to time. The jaundice may be so slight that it is not apparent in the skin. If a sharp look out is kept during one of these attacks of flatulent dyspepsia the whites of the eyes will be seen to become brownish green in colour and if the urine is examined a trace of bile may be found there also. Attacks of biliary colic may occur from time to time. The pain of these attacks is excruciating in character. It is localised in the right upper quadrant of the abdomen and radiates to the back in the region of the shoulder blade. Jaundice and vomiting are usual accompaniments. The attack comes on quite suddenly, lasts for a varying length of time, usually a few hours and passes away equally suddenly. During the attack the patient may be doubled up with pain or may writhe in bed in his agonies. During such an attack little

can be done for the patient. If the diagnosis is certain, hypnotics like morphia and anti-spasmodics like atropine should be given. Medical treatment however is of little avail. The jaundice cure of gypsies and other herbalists on investigation have been found to be merely antispasmodic drugs that as a rule are far less powerful than atropine. No solvent for gall-stones has yet been found. If a gall-stone is too large to pass from the gall-bladder by way of the normal passages into the intestine the only practicable method of removing it is by surgical intervention.

Surgical removal of a diseased gall-bladder is one of the most gratifying operations of modern surgery. People who have suffered for years from flatulent dyspepsia and recurrent attacks of biliary colic, are restored to health after this operation and after years of semi-invalidism are once more able to take their place in society as normal members.

The Kidney and the Urinary Bladder. The bowel excretes mainly food residue and the debris of its own lining membrane. The kidneys excrete the waste products of the tissues of the body and are therefore the main organs of excretion. If both kidneys are so damaged by disease that they cannot function, death results. Thus it is of extreme importance to try and prevent inflammatory conditions of neighbouring organs, such as the urinary bladder, involving the kidneys.

The chief symptoms of disease either in the kidneys or in the bladder are pain, frequency, and difficulty in micturition, pus in the urine, and perhaps blood. It is often very difficult to decide in a case presenting these symptoms whether the kidneys or the bladder is primarily at fault. Very careful expert investigation may be necessary to arrive at a correct conclusion. Meantime palliative medical treatment consists of little more than giving plenty of bland alkaline fluids to drink, with perhaps hot fomentations over the bladder and perineal region for relief of pain. Pus and blood are not infrequently passed in the urine without any symptom of any kind. Such a case should always be investigated at the earliest possible opportunity as a serious condition may be present that will be amenable to early surgical or medical treatment. People in hot climates very frequently notice a white deposit in their urine and imagine this is pus. If a drop or two of acid be added to the urine "the pus" will disappear. It is really a deposit of phosphates and is not abnormal.

The urine is a super saturated solution and any change in its reaction or physical properties, precipitates some of its contents. If this occurs in the kidney or in the bladder a "stone" forms. It is now considered that sepsis is an essential in the formation of a stone and pus in greater or lesser amounts is always found in the urine of people suffering from this complaint.

Stone in the Bladder. It is not necessary here to go into detail of signs and symptoms of stone in the kidneys or in the bladder. In both there is frequency of micturition and pain referred either to the tip of the penis or to the groin, the urine contains pus and perhaps blood. With small stones in the kidney there may be attacks of renal colic, the pain of which is agonising and shoots from the lumbar region to the testicle. Stone in the bladder causes excessive frequency of micturition during the day and a feeling of constant desire to pass urine. This desire is relieved when the patient lies down.

The main point to be grasped is that the condition is serious and that expert assistance should be procured at the earliest possible moment.

Gonorrhœa. Gonorrhœa is a disease that is acquired by sexual intercourse with a person suffering from this condition and in an infective stage. The disease manifests itself in 2 to 8 days after connection, the usual time being 5 or 6 days.

In the male the first symptom is a scalding sensation on micturition, the urine feeling as if it were red hot. Soon a discharge of thick creamy pus appears from the end of the penis. The parts here are thick and swollen and there may be a good deal of dragging pain in the back and between the thighs. Fever and general upset increases the patient's miseries. The inflammation is in the passage between the bladder and the exterior. To begin with it is confined to the portion of this passage ("urethra") in the penis, and may be so severe that urine cannot be voided owing to extreme congestion and swelling. Left to itself the acute stage dies down, but though the patient feels more comfortable the disease progresses and becomes much more difficult to cure. In the acute stage the inflammation is on the surface, and though very painful and distressing is relatively easy to treat. Once the acute stage has passed in the untreated case, the inflammation penetrates deeply so that it is practically

impossible to wash out the urethra so as to get an antiseptic lotion into contact with the germs. Further, the germs creep backwards and infect not only the posterior part of the urethra but also the tissues round about, especially the prostate gland, seminal vesicles and perhaps the bladder and very often the testicles. Even then its spread has not finished. The germs may find their way into the blood stream and finally settle down in the joints causing "gonorrhoeal rheumatism". This condition is not only exceedingly painful, but very crippling in its after results, and a large joint like the knee joint may be so affected that it is completely destroyed and movements in it become permanently impossible.

After they have eaten their way deeply into the urethra, the germs lose some of their virulence so that the tissues are usually able to make some effort to localise their effects if not to kill them. Unfortunately these efforts result in building wall of fibrous tissue round the germs. This wall contracts and in doing so, narrows the lumen of the urethra a "stricture" resulting.

It is essential that the patient should lose no time in beginning treatment. If he were wise, he would begin treatment immediately after he has exposed himself to infection: but if he still wiser, he would not expose himself to infection at all.

Prophylactic treatment consists of micturating and washing the parts thoroughly with soap and water immediately after intercourse. The urethra should be washed by running in a little 1 in 5,000 potassium permanganate and allowing it to distend the urethra and then escape. When this has been repeated two or three times the solution should be allowed to run into the bladder. This is done by placing the potassium permanganate reservoir just above the level of the head and then allowing the fluid to run into the urethra at this pressure at the same time making every effort to pass water. This latter effort will result in relaxing the sphincter muscle of the bladder so that the fluid can run into this cavity. As much as possible, at least 4 or 5 ounces, should be run into the bladder and retained there for a few minutes before being passed. Retained in the bladder it helps to prevent inflammation there and while being passed washes out or kills any germ that may be lurking in the urethra.

Many drugs have been used for purposes of lavage in gonorrhoea. Potassium permanganate in the strength in-

icated is perhaps the most powerful and certainly the least likely to do harm. Strong preparations of silver salts like Protargol jelly not infrequently so irritate the urethra by their chemical action that they cause an inflammatory condition which renders the part peculiarly susceptible to infection.

Treatment of acute gonorrhœa is along the above lines, but should always be carried out under medical supervision. If the details of treatment are not properly attended to complications may ensue. Further, it should be remembered that inflammation of the urethra following sexual intercourse is not necessarily gonorrhœa. In the acute stage the trained observer has no difficulty in finding with a microscope innumerable gonococci in the urethral discharge. This is the only really certain method of diagnosing gonorrhœa. Newly married men and others not infrequently find themselves suffering from inflammation of the urethra and cause themselves much mental and physical agony under the mistaken impression that they have acquired gonorrhœa.

In the female the general features of gonorrhœa are the same as in the male. The local features however are very much milder, so much so that the patient may be quite unconscious she is suffering from the disease. The adult female is not unaccustomed to the presence of an irritating discharge from her vagina and the acute stages of a mild attack of gonorrhœa may pass unnoticed. The infection is localised mainly in the vaginal fornices and in the cervix of the uterus. The urethra and the bladder may be affected, but stricture does not follow in the female owing to the wideness of the passage, its straight course and its shortness.

Treatment consists of potassium permanganate douches of vagina, urethra and bladder.

In both the male and female treatment of chronic gonorrhœa and the complications of acute gonorrhœa are for the expert.

Syphilis. Syphilis is caused by sexual intercourse with an infected person in an infective stage. About 2 or 3 weeks after intercourse a small reddish painless swelling appears on the penis or on the skin near. A yellow head develops in the swelling and when this is picked off a raw surface oozing a little blood and serum is found. The swelling feels hardish about the consistency of crepe rubber. Its after history varies. If it becomes infected an ulcer may form which is rather painful and which gives rise to pain and swelling in the

groins. If however it remains clean, pain is not a feature. In any case a further stage in the disease occurs. A skin rash develops, it may be all over the body. The rash is characteristically of a reddish coppery colour and is usually likened to lean ham. Where the skin surface is moist as round the anus foul discharging sores develop ; similar sores may be seen in the mouth. Pains in the joints and a general feeling of malaise are sometimes prominent features at this stage, but may be entirely absent. Left to itself all these above signs and symptoms completely disappear and the patient may have no further trouble perhaps for years. Then the worst features of the disease begin to show themselves. The central nervous system may be attacked, diseases like general paralysis of the insane or locomotor ataxia being the results : bones or muscles may be attacked, foul sloughing intractable ulcers forming : or some vital organ like the heart or liver or a large artery is affected with disastrous consequences.

It is again emphasised that the primary sore is not painful, and that the constitutional symptoms of the earlier stages of syphilis are not marked. Thus it is often found that patients do not even consider the advisability of treatment until the disease is very far advanced and is affecting the entire system. If a person has exposed himself to infection, and if a few weeks after, he notices anything abnormal about his genitals, or if he finds he has a rash of any kind he should immediately seek expert advice. In its later stages syphilis is one of the most appalling diseases from which mankind can suffer. Modern science can prevent any of those dreadful complications if only the disease is taken in time. The infectious nature of the disease should never be forgotten and also the fact that it can be transmitted from one generation to another.

Prophylactic treatment follows the same lines as that detailed in dealing with gonorrhœa. Mechanical cleansing of the part is of far more importance than the use of any antiseptic. Preparations like calomel cream and mercurial washes are merely useful adjuncts.

THE GENITALS

1. **Phimosis.** Phimosis is a condition in which the fore-skin is more or less adherent to the glans of the penis and the opening at the end is so small that urine can pass only with a certain amount of difficulty. It is not infrequently the cause of fretfulness, general ill-health or even fits in male infants.

Treatment consists of either operative removal of the fore-skin (circumcision), or of forcibly dilating the opening and pushing back until the glans is uncovered.

In adults phimosis may be the result of inflammation of the fore-skin especially if there has been any previous tendency to adherence of this part to the glans.

Inflammatory conditions, venereal and other, are very prone to occur under the fore-skin, so that great destruction of the glans penis may ensue. Treatment is prevention. Every male should be instructed to pull the fore-skin back and wash the glans and sulcus behind it while having a bath. If inflammation under the fore-skin does occur, early surgical intervention is necessary.

2. Paraphimosis. When a phimosed fore-skin is pulled back the patient may find it impossible to replace it. This condition is paraphimosis. The narrow opening of the fore-skin presses on the parts behind the glans causing great pain and swelling in the parts in front of it. To effect reduction the swollen parts should be bandaged firmly with a narrow bandage wrung out in cold water. When this has been done, both thumbs are placed on the glans penis, the swollen parts encircled by the index and middle fingers of each hand, and by combined pushing and pulling the parts are drawn into their normal position. If this manœuvre fails an incision into the constricting ring must be made. Reduction will then be easy.

3. Hydrocele. The testis is more or less surrounded by a bag containing normally a very little fluid. Accumulation of this fluid in large amounts is called a "hydrocele". The main symptom is caused by the weight of the fluid dragging on the scrotum and the blood vessels of the testicle. Regular tapping of the bag of fluid can be carried out, but is not a cure. Injection treatment is uncertain in its results, but if for any reason operation is contra-indicated, this method of treatment may be tried. Otherwise a slight operation offers every prospect of permanent cure.

4. Varicocele. The veins of the testicle return to the abdomen through a canal situated just above the groin. Varicosity of these veins is a "varicocele". It is usually found in young men and of itself is of little importance. It may cause a little pain in that region, but usually is symptomless. Its presence however debars a man from entry into any of the public services until the condition has been cured by operation.

In elderly man varicocele coming on fairly suddenly may be caused by some abdominal growth and should lead him to seek medical advice.

5. **Stricture.** Stricture of the urethra can be caused by conditions other than gonorrhœa, but in the vast majority of cases, the gonococcus is the germ responsible. This germ burrows deeply into the mucous membrane lining the urethral tube and at one or more places forms a small deep abscess. When this heals a scar tissue is formed and scar tissue here as everywhere in the body contracts as time passes. Such contraction encroaches on the lumen of the urethra and may even obliterate it. The encroachment on the lumen of the urethra is called a stricture.

It is on all sides admitted that it is unwise to acquire gonorrhœa, but if that disease be contracted it is trebly unwise not to have it thoroughly treated, and in addition, to have the genitalia examined by an expert at least once every 2-3 years and after all signs and symptoms have disappeared. No one can ever say a case of gonorrhœa is cured. The germs lurk for years in the crypts of the mucous membrane of the genito-urinary passages and seem ready to recommence their activity at any time when the patient's health is feeble or when he has traumatised himself in a drinking bout or by sexual excesses.

With the onset of a stricture the patient finds he suffers from a gradually increasing difficulty in passing urine, and notices that the stream in spite of his efforts is feeble and thin. Ultimately he may have an attack of retention of urine, i.e., he cannot force out any urine and he suffers all the agonies of a distended bladder.

In the early stages treatment of a stricture is quite satisfactory, if somewhat tedious and painful. Repeated visits to a skilled physician are essential and treatment to be effective must be continued at increasing intervals during the patient's whole life. Left alone a stricture will always recur.

The great danger of a stricture is an attack of acute retention of urine. Here something must be done to empty the bladder, otherwise the patient will die. Soothing homely measures like immersion in a hot bath are not likely to be effective. A rubber catheter should be used, but usually will not pass the stricture and find its way into the bladder. The correct line of treatment is to dilate the stricture with a metal "sound" and then pass a metal catheter. This however is utterly

beyond the skill of the inexperienced: no mere written description will guide the novice to success. Attempts to force a metal catheter into the bladder will end in disaster.

If no expert assistance can possibly be got the following operation is done, six to eight hours after the onset of the retention. The patient's pubic region is shaved and washed with spirit and painted with iodine. If spirit and iodine are not available the skin may be disinfected by washing with 1 in 30 carbolic lotion. The bone of the pubic region is carefully felt and a point on the skin one inch above its upper edge in the mid-line is determined upon. All instruments being ready and sterile, as also the operator's hands, a small pledget of cotton wool soaked in pure carbolic acid is taken in a forceps and an area of skin $1'' \times \frac{1}{4}''$ painted with the acid, the line beginning at the selected point and extending upwards. Pure carbolic acid is an anæsthetic to the skin to which it is applied. Hardening his heart, the Surgeon takes his knife and makes a cut in the middle of the painted line $1''$ long. By rapid successive strokes he deepens this cut. There may be a good deal of bleeding; the patient will suffer considerable pain; the operator may feel faint. He must however continue until when he has despaired of the accuracy of these directions, he finds that by deepening his incision straight backwards he punctures the bladder and a stream of urine squirts out. He may have to cut through 3-4" of bleeding tissues to do this, but he must go on. If he follows these directions and deepens his incision backwards with a tendency to go downwards towards the perineum rather than upwards towards the navel in the deeper parts of the wound, he can do no possible permanent damage.

Immediately the stream of urine appears he must enlarge the opening into the bladder until it is at least $\frac{1}{2}''$ long and then rapidly thrust a rubber tube into the bladder so as to drain away the urine into a receptacle by the bed side. The tube is kept in position by tying it to a bandage round the patient's body, vaseline dressings being applied to the wound itself. After 12 hours, having recovered from his unpleasant experience, the patient should be transported to the nearest hospital however far away. He will dribble urine through his suprapubic wound and be wet and most uncomfortable as well as most odoriferous, but he will not again suffer from retention.

In old people with damaged kidneys, acute retention is

very serious and may be fatal because of renal failure even when expert treatment is carried out early. Crude surgery at any stage in such patients will be fatal.

6. **Prostatic Enlargement.** The prostate is a male sex gland about the size of a chestnut, situated at the base of the bladder with the urethra running through its centre. The urethra is a tube conveying urine from the bladder to the exterior. For reasons not understood the prostate gland tends to enlarge with advancing age. This gives rise to increased sex desire, but not to increased sexual power.

An important medical result of prostatic enlargement in old men is difficulty in passing urine. The urethra is encroached upon by the swollen gland and the act of micturition is difficult to begin, and when begun the stream is feeble and emptying of the bladder incomplete. The urine left inside the bladder becomes stale and decomposes, poisoning the muscular wall of the bladder with which it is in contact. The poisoned muscle becomes weaker and weaker, and hence still less able to force urine past the obstructing prostate. In the last stages the bladder is enormously distended and a few drops of urine dribble out incessantly, as fresh urine is forced into the bladder from the kidneys. The latter by this time are always affected more or less and a not unwelcome death from renal failure puts an end to the patient's misery.

In the early stages of prostatic enlargement much may be done to ward off the symptoms by such measures as drinking plenty of bland fluids, abstaining from alcohol, spices and other irritating substances, foregoing sex in all its forms, physical and psychic, and having any latent infection, e.g., old gonorrhoea, thoroughly treated.

Where such measures are not enough, surgical removal of the gland gives most excellent results, urinary distress vanishes and sexual desire and power may return. This can happen when surgical advice is sought before inflammatory changes have taken place in the bladder and before the kidneys are damaged. Treatment then is much more difficult, but even then much may be done to make life easier.

Occasionally as a result of a chill, excess of alcohol or some injury the patient finds he is quite unable to pass urine. Very little difficulty will be experienced in passing a well lubricated sterile rubber catheter and drawing off the urine. This latter should be done slowly, a small spigot of wood being put in the open end of the catheter and about 2 oz. of urine allowed to

escape every 10 minutes. Rapid emptying of the bladder may give such a severe shock to the kidneys that they stop excreting urine with fatal results.

7. Orchitis or Inflammation of the Testicle. The testicles may be inflamed, swollen, red, hot and painful in the course of general fevers, *e.g.*, mumps. The condition, though annoying, is not serious and complete recovery in a few days is almost invariable. To soothe the pain, the testicles should be supported by a suspensory bandage and a cooling lotion applied.

The testicles may be attacked as a complication of gonorrhoea the inflammation begins behind, in a part of the organ called the epididymis and may spread from there to involve the entire testicle. Abscess formation is frequent.

The patient should be confined strictly to bed, have a brisk purge and given plenty of bland fluids to drink. Hot fomentations should be applied to the part and a suspensory bandage used. The concomitant gonorrhoea requires treatment.

Kicks and blows on the testicle are very often followed by fainting. The usual general treatment for shock as previously outlined should be given to revive the patient. A suspensory bandage worn for a few days is all the local treatment usually necessary.

THE EXTREMITIES

1. Tuberculous Arthritis (Tuberculous inflammation of a joint). This disease is usually found in children, the hip joint being that most frequently attacked. In adults the knee and ankle joints are perhaps those usually affected, local pain, especially in children may be severe, the general health is very adversely affected. In adults gradually increasing stiffness of the joint with wasting of the muscles is the prominent feature of the disease: pain is not marked and may be absent. Left untreated there is a tendency for gross deformity to occur with almost complete loss of function of the limb. Further, the tuberculous pus will find its way to the surface, burst and form a discharging sore that will not heal and which may become cross infected, *i.e.*, infected by other organisms.

Treatment is a very difficult and very lengthy matter. A normal limb very rarely results even under the most favourable of circumstances; but early treatment can prevent the worst features of the crippling deformities that are so apt to occur.

2. **Acute Suppurative Arthritis** (Septic inflammation of a joint). This condition is caused by septic organisms finding their way into a joint. Their usual mode of entry is by the blood stream. Some local injury such as a sprain or a blow on the joint seems to act as a predisposing cause. All grades of severity are found, from slight local pain and swelling to excruciating pain in the part accompanied by severe toxæmia and high fever. The part should be splinted and some of the pus aspirated for examination. In mild cases properly treated complete recovery is the rule. In the more severe cases, a certain amount of stiffness must be expected, and in the most severe cases the surgeon may have to use all his endeavours to save the patient's life and may have to sacrifice the limb.

3. **Bursitis** (House-maid's knee). A bursa is a small bag of fluid placed over a bony point subjected to habitual pressure such as the knee and elbow. When pressure is excessive such a bursa becomes inflamed. An excessive amount of fluid is poured into it and it forms a swelling which may become infected. Such an inflammation in the bursa in front of the knee is called house-maid's knee.

If complete rest to the part is given and kneeling discontinued the swelling if uninfected may disappear: if not it should be removed surgically. The treatment of an infected bursa is similar to that of an abscess.

4. **Bunion**. A bunion is a painful swelling on the side of the base of the great toe, which is usually deformed in that instead of being straight it points towards the outer side of the foot (Hallux Valgus). The painful swelling consists of an inflamed bursa lying over a sort of button of bone growing from the side of the bone of the great toe (First Metacarpal). Wearing properly fitting shoes will do much to prevent the condition occurring. Deformities of the feet of this kind are quite frequently hereditary, and if the children of parents who suffer from Hallux Valgus and its attendant complications find that they too are developing similar deformities, they should be very careful in their choice of foot wear.

Palliative treatment for acute pain and inflammation in a bunion consists of hot fomentations and rest. Permanent relief, if not complete cure, can be got by a properly planned and carried out orthopædic operation. Many people suffer agonies from this condition for years and do not seem to realize that surgical measures will give them relief from their miseries.

5. **Hammer Toes.** Hammer toe is caused by a short angular deformity in the first of the joints between the bones of the toe. The toe instead of being straight forms two sides of a triangle. The apex of the angle presses against the upper of the boot and the two ends on the sole. Painful corns form in all three places.

In the milder degrees of hammer-toe a specially designed shoe may give relief. In the severer forms operation is most satisfactory.

6. **Flat Foot.** Normally the weight is put on the outer side of the foot, which is specially adapted for this purpose. The high arch on the inner side of the foot is intended not for weight bearing, but to give spring and elasticity to the movements of walking and running. Apart from the shape of bones and the strength of the ligaments, the chief factor maintaining this arch is the strength of the muscles in the calf of the leg. When these muscles become weak or if for any reason their action is unbalanced, *e.g.*, as a result of a badly set fracture, the weight comes to fall more and more on the inner side of the foot and the arch is gradually flattened out. While the arch is falling pain and discomfort may be extreme. After the arch has become completely flattened out pain ceases and the sufferer from flat foot may walk 20 miles a day without any discomfort.

Treatment to begin with is to remove the cause if possible, *e.g.*, the malalignment of a badly set fracture. Raising the inside of the shoe by placing a wedge of leather a $\frac{1}{4}$ inch thick along the inner border will tend to throw the weight of the body on to the outer side of the foot. This may be all that is required in mild cases. For severer cases manipulation under an anæsthetic and rest in plaster of paris for a month or so will probably be necessary.

7. **Varicose Veins.** Most of the veins of the body have valves in them so that the blood may go towards the heart, but not in the other direction. These valves for various reasons very often give way and atrophy. The effects of this are specially seen in the surface veins of the legs. These veins have a long course unsupported by muscles or strong fascia round them. In the upright position they have to withstand the pressure of a long column of blood. The valves having given way the veins compensate by becoming tortuous, so that the column of blood becomes broken up. In the last stages the blood seems actually to be forced backwards

especially into the capillaries of the skin. The skin in such areas gives way and a varicose ulcer results. A dilated vein may burst into such an ulcer and severe hæmorrhage ensues.

The modern treatment of varicose veins has practically replaced the old fashioned operative measures. In the early stages injection of certain fluids into the veins affected causes these to shrink and disappear. In the later stages, where there is varicose ulceration the proper application of elastoplast bandages has a most beneficial effect. Varicose ulcers of 20 or 30 years duration can be healed in almost as many days. The elastoplast bandage does not interfere with normal activities. It causes a slight amount of pain for the first 2 or 3 days, but after that the chronic sufferer feels more comfortable than he has for years.

8. Whitlow. A whitlow is a septic inflammation of a finger or toe, usually a finger. The sepsis may be situated in the pulp of the finger, in the nail, in the tendon sheath, or in the bone. Pain is very severe and little mitigated by hot fomentations. There is usually a good deal of fever and a general upset so that the patient has to be nursed in bed. A whitlow is a very dangerous affection. It may spread generally and locally with very grave consequences. Its local spread in the tissues of the hand causes extensive damage, and the use of the hand may be more or less lost following too late surgical intervention.

Treatment is surgical. The finger must be incised and the pus allowed to escape. If a surgeon is not available it should be remembered that an incision over the front of the finger does the maximum of damage and gives the minimum of drainage. Even if the abscess is pointing in the front of the pulp of a finger the cut should never be made here. The abscess should be opened from the side. The incision should extend into healthy tissues on other side or from the tip under the nail backwards into healthy tissues. In depth it should go down to the abscess cavity wherever that is situated.

9. Ingrowing Toe Nail. The pain of an ingrowing toe nail is not infrequently caused by the pressure of too tight boots. Another common cause is incorrect paring of the nail. There seems to be an idea that the nail should be cut as close as possible at the side, i.e., where the pain is being caused. Such paring merely encourages the nail to grow in the wrong direction. The nail should be cut at first absolutely square across. The scissors or much better a proper and a powerful

nail cutting forceps are then applied to the middle of the cut surface so that a crescentic edge results the concavity looking forwards. Little more can be done at the first sitting, but after 24 hours it will be found possible further to cut into the middle of the nail. This results in giving room to the nail to grow towards the middle and takes the pressure off the sides where it is cutting into the flesh. The nail is sometimes so thick that it must be softened with caustic soda and part of it scraped away before it can be cut.

If sepsis ensues in an ingrowing toe nail, and this not infrequently happens, the nail should be cut as above and fomentations applied. In the worst cases a slight surgical operation gives most excellent results. A small strip of the nail is removed from the sides including the nail bed so that the nail will be permanently narrowed. Complete removal of the nail without in any way narrowing the nail bed is useless; the nail grows again.

Deformities. All deformities may be roughly grouped under two headings, congenital and acquired. A congenital deformity is one due to an error in development and is present at birth. During growth the deformity may tend to become increased or it may do so when the child begins to use the deformed part. In congenital club foot for example the foot is turned inwards, so that the child tends to walk with the weight resting on the extreme outer side of the foot, instead of on the sole. If the child is allowed to continue to walk in this fashion the deformity is increased. In this case as in many other congenital deformities early treatment can prevent the condition becoming worse. In the example quoted, early treatment consists of manipulating the foot while the tissues are still pliable and while the "bones" are still made of gristle (cartilage) for the most part. The foot is thereby encouraged to adopt its natural shape and position. If treatment is delayed, more violent surgical procedures become necessary and the results obtained, although satisfactory, are not to be compared with the results obtained when the case is submitted to proper treatment a few days after birth.

The commonest congenital deformities other than club foot, are knock-knee, bow leg and lateral curvature of the spine (scoliosis). To all these the above remarks about the efficacy of early treatment apply with equal force.

The commonest cause of acquired deformity is infantile paralysis. This is a disease which usually attacks children

but may attack adults. The disease is one primarily of the central nervous system. Groups of cells in the spinal cord are attacked as a rule so that certain muscles become paralysed. The disease starts exactly like a mild attack of influenza. This lasts for a week or so and when it has passed it is found that the patient is partially paralysed. The distribution of the paralysis is very irregular and varies greatly in its extent. The muscles of the arm legs or back may be affected, on one or both sides. The patient may be almost completely helpless or a single muscle may be picked out so that some particular movement only is affected. All grades of severity between those two extremes is found. For a few months after the acute stage of the disease has subsided, the affected muscles are sore and tender especially when pressed or pulled upon. During this stage the affected muscles must be kept at absolute rest in a relaxed position so as to prevent their degeneration. It may be repeated that this disease is one of the central nervous system and not of the muscles themselves. The tendency is for recovery to take place. The affected groups of nerve cells resume their normal function to a greater or less extent. If however the muscles have been allowed to become stretched and destroyed, they will be unable to respond when their nerves once more resume their normal control. The initial paralysis is invariably much greater than that which will be permanent. Therefore preservation of the muscles pending recovery of the nerve cells is of a very great importance. The muscles are preserved by keeping the part affected at rest by means of a splint. The most convenient and effective form of splint is one of plaster of paris. Palliative treatment along these lines should be continued for about 2 years as recovery of the nerve cells to a very large extent is still possible during this period.

If the case be neglected especially in a growing child, the processes of growth as well as the unopposed contraction of the unaffected muscles tend to make the part lopsided, *e.g.*, if the muscles on the outer side of the leg are paralysed those on the inner side pull the foot inwards and a club foot results. Other deformities such as curvature of the spine occur for the same reasons. Such deformities can be prevented to a great extent and even if paralysis of the muscles is permanent, plastic operations like bone-grafting and transplantation of tendons may be carried out with every chance of success.

The Spine. Paralysis of the muscles of the back lead to a lateral deformity. Disease of the bones of the spine results in a hunch back, *i.e.*, an angular deformity in the antero-posterior plane. The bones of the spine are not infrequently attacked by tuberculous disease especially in children. To begin with there is pain and stiffness in the affected region. Later on as the bone substance is destroyed by the disease, the spine collapses, thus producing the angular deformity mentioned above. If treated early this deformity can be prevented. But treatment must extend over a number of years as the disease tends to recur if any excessive strain is put on the spine before it has completely recovered.

Lymphatic Glands. In acute septic conditions, *e.g.*, an abscess, the lymphatic glands of the area become swollen and painful, subsiding as a rule, along with the inflammation. If the infecting germs are especially virulent the lymphatic glands may break down, so that one or more becomes itself an abscess requiring incision and drainage. The lymphatic system is one of the defensive mechanisms of the body. Invading organisms are carried to little nodules of lymphatic tissue (lymph nodes or glands) and there as a rule destroyed though sometimes the germs win their fight there so that an abscess results as we have just seen.

The lymphatic glands all over the body are sometimes enlarged as a result of blood diseases or of specific fevers like german measles and also in the secondary stage of syphilis. In children the lymphatic glands of the neck are very often enlarged as a result of infection by tuberculosis. The tubercle bacillus probably gains an entry by way of the tonsils and settles down in the neck glands. In such cases the tonsils themselves are diseased, and have been attacked not only by the tubercle bacillus, but by other germs. These latter are chiefly responsible for the enlargement of the neck glands. Therefore if the tonsils are enlarged and diseased they should usually be removed. Even after the neck glands have become swollen as a result of tuberculous infection, removal of the diseased tonsils is not infrequently followed by cure of the whole condition (*see* Chap. VI, p. 230).

Left untreated tuberculous neck glands in children frequently turn into small abscesses, which burst through the skin and require prolonged treatment before they will heal. The child's general health meantime becomes

undermined and he does not develop at a normal rate. Timely removal of the diseased tonsils prevent such untoward happenings.

Filariasis and Elephantiasis. These conditions are due to infection by a parasite the *Filaria Bancrofti*. An infected mosquito bites a man, the filaria larvæ burrow their way to the lymphatics, mature and produce embryos which go into the deep veins and at night into the peripheral circulation. These embryos are small and of themselves harmless. The adult worms however are 2 to 4 inches in length and though very slender coil themselves up and so obstruct the lymph channels in which they lie. This obstruction is apparently of itself never complete and will do no harm unless the vessels became inflamed, as a result of a septic wound. Under these conditions, the lymph vessels scar and contract, and permanent and complete obstruction results. This shows itself as chyluria, elephantiasis, lymph scrotum, &c. Chyluria means passing of milky urine which clots on standing. Attacks are painless and intermittent; if frequent, wasting and loss of strength become very great. The milky substances in the urine are fats that should be used by the body as food. The loss of these fats is the cause of the wasting. The lymph vessels round the kidney in these cases are obstructed, burst into the substance of that organ and so the fats escape with the urine.

Elephantiasis means a thickening of the skin, usually of the leg or scrotum and swelling of the subcutaneous tissues of these regions. It is due to obstruction of the local lymphatics.

Lymph scrotum is a condition in which the surface lymph channels are swollen and distended with lymph as a result of block higher up. They are very liable to rupture and discharge a fatty fluid (chyle) in large amounts. Healing is a very slow and difficult process.

Treatment is most unsatisfactory at present; no drug has yet been found that will kill the worms or parasites. It will be observed however that a combination of factors, *i.e.*, a very heavy infection by adult worms with sepsis superadded, is necessary to produce symptoms. In endemic areas, the natives contract the disease because they are bitten several times nightly by infected mosquitoes and their legs and feet are unprotected during the day and very liable to have repeated septic cuts and bruises. Europeans on the other hand use

mosquito curtains more or less regularly and septic sores on the feet are not common. Hence the disease rarely attacks a European even when he is long resident in a district where filariasis abounds.

Treatment of the fully developed disease is surgical and the results are not very encouraging except in elephantiasis of the scrotum. Here the whole of the affected skin can be cut away and a new bed formed for the testicles which are quite healthy and which are never affected in this disease.

Guinea Worm. A guinea worm is a parasite that may live part of its life in a human being. When the adult female guinea worm reaches a stage of her life when she has to lay her eggs, she comes to the surface of the body apparently hoping to find water where her eggs will flourish. Thus in the case of the water carriers of the east who carry water slung across the shoulder in a sort of leather bag, the guinea worm often protrudes itself where the moist leather is in contact with the back. The little punctured hole made by the guinea worm protruding her head frequently becomes septic and the abscess is rather difficult to treat as it burrows in the tissues following the track of the guinea worm's body. The guinea worm in those septic cases not infrequently dies.

The worm can frequently be observed just under the skin and should be encouraged to come out by keeping the skin moist by means of cloths rung out in water. When the guinea worm's head projects it should be seized and wound on a match stick, extreme gentleness being exercised so as to avoid breaking it. The part is kept constantly wet and the guinea worm patiently rolled up on the match as quickly as the body is protruded. If the worm is broken the part left inside remains alive and will cause a recurrence of the whole trouble. No drug has yet been found that in any way seems to be able to harm the parasite.

Malignant disease (Cancer). In the beginning two cells, the ovum and the spermatozoon, unite to form a single cell, the fertilised ovum. This cell reproduces itself many countless million times in an orderly fashion. The ultimate product of its activity is the fully formed man or woman. In malignant disease a cell or group of cells in the body of an individual appears to become endowed with this quality of endless reproduction of itself. Unlike the fertilised ovum however its reproduction is not orderly and the products of its activity far from serving any useful purpose to the individual

act upon him like a parasite and may make such demands on the system as finally to kill him.

The two chief types of malignant disease are Sarcoma and Carcinoma.

Sarcoma is malignant disease as it affects connective tissues such as fibrous tissue and bone. Sarcoma of bone is one of the most rapidly fatal tumours of the body and its treatment is almost hopeless. It usually attacks young adults or children and is characterised by early persistent pain in the part and rapid general weakness and decline. Small fragments of the growth are very early swept away by the blood stream and become lodged in the lungs and other parts of the body, so that amputation of the affected limb, even when carried out early, may be quite ineffective. Fortunately bone sarcoma is a rare disease. The other forms of sarcoma if more common are less dangerous. Early surgical removal gives quite good results.

Malignant disease in a gland such as the breast, uterus, stomach, skin, glands, &c.. is termed carcinoma. Unlike sarcoma this disease in its early stages does not cause pain, which is most unfortunate as in its early stages carcinoma can be treated with a very good prospect of recovery. It is prone to attack people of 40 years of age and over. In its early stages its symptoms are merely those due to its mechanical position, *e.g.*, in the breast there is a lump of whose existence the patient is aware, but which causes no other trouble. On the other hand if for example the large intestine is the site of a cancer, passage of the intestinal contents is mechanically impeded. The patient suffers from gradually increasing constipation with perhaps the passage of a little blood in the fæces, explained away as coming from piles; increasing doses of castor oil fail to give relief and left to itself the condition will progress until complete obstruction of the bowel ensues.

In its early stages, carcinoma is a localised disease. It tends to spread into the surrounding tissues, into lymphatic channels and also by way of the blood stream so as to spread all over the body like a sarcoma. Such spread, by the blood-stream, however, is a late manifestation as a rule. Long before this occurs the growth has progressed locally to such an extent that the patient is aware that something is the matter with him, although he may refrain from calling in medical assistance because he is not suffering from pain. Carcinoma

presents itself in many situations and in many different shapes and forms. It is impossible here to go into detail. Elderly people however would be well advised to seek medical advice when they find they are suffering from some relatively painless swelling or ulcer in any part of the body or if they find any abnormality in the action of their bowels.

It has been found as a result of experience that certain varieties of carcinomatous cells can be killed by applications of Radium and by special doses of X-rays ; other varieties remain unaffected by such measures and surgical removal offers the only prospect of cure. It must however be realised that a carcinoma kills not so much because of the presence of the chief growth, but because of the innumerable lesser growths, springing from it. Treatment by Radium and X-rays is just as much treatment of the local condition as surgical removal of the growth. There is unfortunately nothing magical in the effects of these agents on the tumour cells that have spread into distant parts of the body such as the lung. The advantage that treatment by X-rays or Radium possesses over surgical removal of the part is that a mutilating operation such as amputation of the breast is avoided. The malignant cells are killed while the normal tissues are relatively unaffected. Therefore it is just as important for a cancer of the breast to be diagnosed early if it is to be treated by Radium as if it is to be treated by surgical removal. Modern methods of treatment of cancer by X-rays and Radium have done away with the necessity for some of the very extensive and mutilating operations that used to be performed a few years ago, but the mortality rate has been very little altered. People, even elderly people, who should know better are still reluctant to consult their doctors about a disease that does not very greatly inconvenience them, and that does not cause pain. Symptoms, if pronounced, are less symptoms of carcinoma than symptoms of septic complications in the growth. By the time these appear the most favourable stage for treatment has passed.

Rupture or Hernia. In the abdominal wall there are several places that are mechanically weak and two such places are found in the region of the groin. Nature has arranged the muscles so that they might guard these weak places but occasionally her precautions are inadequate and some of the abdominal contents come to be forced outside—a rupture or hernia results.

The abdominal wall is lined by a membrane called the peritoneum which is very thin, but very elastic. Thus when a hernia takes place and a piece of bowel is pressed out of the abdomen, it does not lie free amongst the muscles, fat and other tissues of the groin: it lies in a bag or sac of peritoneum which is smooth inside so that if proper measures are taken early, there is every opportunity for the piece of gut to slip back to its original position.

On the other hand the sac of peritoneum can show no such tendency to slip back as its outer surface is rough and quickly becomes adherent to its surroundings. Thus when once a hernia has appeared there is always a tendency for it to recur, as the sac of peritoneum is permanent and its smooth lining can offer no resistance to the entry of a loop of gut.

In its essence a truss consisted of a firm pad applied to the hernial site and pressed firmly over it by means of a spring. The idea was to press together the walls of the peritoneal sac so that nothing could force its way inside. This did not happen as there is nothing very firm behind the sac against which it could be squeezed; further, the constant pressure of the pad caused atrophy of the muscles, whose function it was to guard the hernial orifice. Therefore under treatment by a truss, the hernia merely became slowly bigger and the last stage was far worse than the first.

The modern operation for hernia is extremely satisfactory, and with modern methods of anæsthesia there can be few cases even in patients elderly and feeble where operation is contra-indicated. In younger people nothing else should be considered. A hernia is always a handicap; it may become dangerous, and will never undergo spontaneous cure. In children a hernia is usually due to a congenital abnormality.

When it first appears in an adult, a hernia results from some very violent muscular effort in which the abdominal wall is made tense and the breath held, *e.g.*, as in lifting a heavy weight. The patient has a sharp pain in the groin and a sense of something having torn and given way: he feels sick, he may faint or vomit. When he recovers a little he finds a lump in his groin, tender to pressure and firm in consistency. He goes to bed, lies curled up, perhaps with a hot bottle over the groin and is very much relieved to find that in a few hours the lump has disappeared and the symptoms have gone. Further, muscular exertion brings a reappearance of the hernia which gradually increases with each attack in size, until it no longer

goes back of itself. The patient then discovers he can manipulate it back by pressing gently upwards and outwards and backwards with the flat of the hand, the last portion of bowel usually disappearing with a gurgling noise that is quite easily heard.

All this time the peritoneal sac has been becoming large and larger, but the body of the sac enlarges much more than the "neck" *i.e.*, the place where it joins the peritoneal cavity. Thus there is a tendency for the neck to constrict the ends of the bowel in the sac and if for any reason, *e.g.*, excessive strain, a larger piece of bowel than normal is forced into the sac, strangulation occurs.

Strangulation is the great danger of hernia and may occur at any time, from the first appearance onwards. The lumen of the bowel is obstructed so that the intestinal contents are dammed up, and more dangerous still, the walls of the bowel at the neck of the sac are so squeezed that their blood supply is impaired; if nothing is done, a ring of gangrene results. The bowel perforates, the septic intestinal contents pour out and find their way into the general peritoneal cavity; general peritonitis ensues and death rapidly follows.

When strangulation first occurs the patient feels an intense pain in his groin; he becomes sick and may vomit, the vomit consisting only of stomach contents which may vary from a little bile stained mucus to a full meal. He has a desire to pass faeces and if his lower bowel is full, does so; thereafter neither solid, liquid or gas passes from the anus. After the first shock is over, the chief complaint is of recurrent attacks of severe colicky griping pains gradually increasing in intensity. If nothing is done to relieve the patient vomiting begins—a very evil omen. The vomiting is bile stained and very offensive; it becomes more persistent and dark in colour. The griping colicky pain dies away. The patient has bright eyes and hollow cheeks; he has a peculiar strained anxious look; the pulse is rapid and feeble; the temperature is subnormal, vomiting becomes more incessant and quite effortless—huge mouthfuls of exceedingly offensive faeculent material being belched up. Death is now very near.

Immediately after the onset of strangulation, the patient should be put to bed with the foot of the bed raised 10 or 12 inches; he should either lie on his sound side with his knees well bent or on his back with the knees supported on numerous pillows. A sedative like 30 grs. of bromide and 10 grs. aspirin

are given and a hot bottle over the hernia itself may be applied. On no account should the first aid worker attempt to push the bowel back into the abdomen. In ninety per cent. of cases the simple methods described are sufficient and the gut returns of its own accord. If it does not, it means that the neck of the sac is exerting serious pressure on the bowel and that the only safe method of treatment is surgical. The untutored hands of the first aid worker will almost certainly rupture the bowel if reduction be attempted, and he can best serve his patient by recognising early the gravity of the condition and getting skilled assistance at once.

Spermatorrhœa. Spermatorrhœa consists of involuntary discharge either of semen with the secretion of the prostate gland, or of the latter alone. The fluid has a milky appearance. Occasional nocturnal discharges of this description *are of no consequence*. In severe cases similar discharges may occur during the day. Often this depends on certain bad habits, and the result will cease when such practices are discontinued. Such discharges are often associated with dyspeptic symptoms, and the patient is frequently out of health, and tends to become depressed. The recurrence of the symptoms tends to exaggerate the depressed condition, the mind of the patient dwells needlessly upon it, and he erroneously supposes the malady to be of great importance, and is often led astray by unscrupulous advertising harpies, who make their living by preying upon the fears and anxieties of their timid fellow-creatures. If the spirits are depressed, change of employment, or relief from mental occupation, and change of locality are indicated. In the meantime the bowels should be kept open, and the closet should be visited in the evening, so that the lower bowel may be emptied before the person retires to rest. Late suppers should be avoided, and no spirits should be taken. The patient should sleep on a hard bed, and be lightly covered, and he should not lie on his back. As medicine, if there are no prominent dyspeptic symptoms requiring treatment, and if the bowels are sufficiently open, quinine and iron (Prescription No. 51), with double doses of bromide of potassium (Prescription No. 55) at night and a cold bath in the morning.

CHAPTER X

DISEASES OF THE SKIN

Introductory : Acne : Birth-marks : Boils : Carbuncle : Chaps : Chilblains : Eczema : Erysipelas : Erythema : Frost-bite : Hair, Falling of the : Herpes : Impetigo : Loucoderma : Lice : Lupus : Moles : Nails, Diseases of the : Oriental Sore : Pemphigus : Prickly Heat : Prurigo and Itching : Psoriasis : Ringworms : Scabies or Itch : Seborrhœa : Sudamina or Miliaria : Ulcers : Urticaria, or Nettle-rash : Warts.

THE following terms are used in describing eruptions of the skin.

Macule. A macule is a part of the skin of changed colour and definite outline which is not raised above the surface of the surrounding skin.

Papule. A papule is a solid elevation of the skin not bigger than a pea.

Vesicle. A vesicle is an elevation of the skin of the same size as a papule, but containing some clear fluid.

Bleb. A bleb is elevation, larger than a pea, that is full of liquid.

Pustule. A pustule is an elevation of the skin containing pus : it always develops from a vesicle.

Acne. Acne is an inflammatory process occurring in and around the sebaceous glands and due to a special organism. It consists of isolated pimples, or pustules, forming on a hard red base in the sebaceous glands of the skin, sometimes very long in coming to a head, and most frequently seen on the nose, but sometimes on the back, cheeks, forehead, or chest. Acne pustules are sometimes preceded by 'blackheads,' which are due to stoppage in the sebaceous glands by dirt and scales and secretion accumulating there. One variety of acne is associated with dyspepsia and excessive consumption of alcohol ; but common acne is essentially a disease of the age of puberty. It usually occurs between the ages of twelve and twenty-five years.

The *treatment* of acne is preventive and curative. For the former frequent and vigorous washing with soap and water and friction with a rough towel ; while the rubbing in

of sulphur ointment, 10 grains to the ounce of vaseline, is also useful. To be avoided are alcohol, tea, and coffee. For curative treatment the blackheads should be squeezed out, and the affected area washed with a mixture of spirit and soap. If very obstinate, a vaccine may be injected to cure this condition.

Birth-marks. The ordinary birth-mark or 'port-wine mark' is scientifically called a *nævus* or a cutaneous angioma.

These marks occur most frequently on the face, head, and neck ; but are met with in other parts.

For the very large *nævi* there is, as a rule, nothing to be done, at any rate not when they affect a large area of the face : because the scars left by treatment might appear worse than the original port-wine stain.

But a *nævus* of moderate dimensions may be successfully treated in several ways, of which the most popular now is by means of carbon-dioxide snow. Next to that electrolysis has given the best results ; or a small *nævus* may be altogether excised. The patient should put himself in the hands of a surgeon ; he should never himself attempt any treatment of a birth-mark.

Boils. A boil is due to the destruction of a small portion of skin and subcutaneous tissue by the action of micro-organisms. The dead tissue is usually round the root of a hair ; and this central slough is called the 'core.' Boils are common in India, especially during the latter part of the hot weather or during the rains. They may occur singly, or several at once, or in successive crops ; and they may vary in size from a pea to a hen's egg. Large boils most frequently occur on the limbs, on the back of the neck, in the armpit, or about the buttocks, and are often long before coming to a head. In some instances after pain and swelling have occurred the boils gradually subside without the formation of matter, and are then popularly termed blind boils. There are two factors in the causation of boils : one lies in the general health, the other in local infection. As regards the former, poorness of blood, heat, overwork, and attacks of fever are predisposing causes. There appears to be something in the popular idea that excessive mango eating may cause boils, though the saying is probably equally applicable to other fruits and to the taking of much lime juice. These fruit juices appear to reduce the amount of calcium in the blood and so predispose apparently to boils. At any rate if one is subject

to boils one should stop taking lime juice and take fruits only in moderation. As regards the local infection, one boil often infects the adjacent skin and causes another. A similar occurrence is seen in styes of the eyelids, which will sometimes alternate from one lid to the other as each one becomes infected.

Treatment. If the boil is a big one, it should be treated, both as regards fomenting and lancing, as described under 'abscess' on p. 331. Afterwards it should be dressed as there described. If the boil or boils be small, they should be covered with 25 per cent. ichthyol ointment spread on lint. If that is not available use the iodine paint of Prescription No. 9, applying it for an inch or two round the boil as well, two or three times daily. Any discharge should be carefully wiped away with woollen swabs dipped in 1 in 20 carbolic lotion. Care must be taken to prevent local infection, which may easily be caused by a little of the discharge touching or being wiped on healthy skin. If a boil is seen early it may sometimes be 'aborted' by sharply pulling out the central hair. This should always be done at any stage if a hair can be seen.

In addition to this local treatment the bowels should be kept open and tablets of calcium sulphide, $\frac{1}{4}$ grain, should be taken four times daily. This will often prevent the onset of other boils. If a crop of boils is at all persistent there are, besides the above treatment, three things that must be done. First, the urine should be examined to see if it contains sugar, as diabetics are especially liable to such crops of boils (*Furunculosis*). Secondly, the injection of a vaccine by a medical man should be undertaken. Thirdly, the patient must get away from his work and from the plains of India and either go home on leave or immediately to the hills.

There is a special form of sore sometimes called a *Delhi* boil or a *Baghdad* boil: this will be found described on p. 389 under the name 'Oriental Sore.'

Carbuncles. A carbuncle resembles a boil (*see* p. 332) except that it is more extensive and involves deeper tissues than a boil. Carbuncles are most frequently situated where the tissues underlying the skin are of a dense fibrous character, as the nape of the neck, the back, or buttocks. A serious form may appear on the face. Carbuncles are usually seen in debilitated people over forty-five years of age, especially if suffering from diabetes. They result from an impure and debilitated condition of the blood; but their appearance at

any particular part of the body may be determined by an accidental injury. Carbuncles vary in size, sometimes being as large as an orange. They are at first very hard painful and cause the skin above to become of a dusky red colour, which gradually fades off into the surrounding skin without any defined border. As the carbuncle forms, matter and sloughs are discharged from several small openings. The progress of the disease is slow; but after a time, generally two or three weeks, the whole of the affected skin and tissues underneath slough away, leaving a deep, irregular cavity, which burrows under the neighbouring skin. Carbuncles are commonly attended with much constitutional disturbance, such as fever, perspiration, and debility. The strength must be kept up by nourishing diet and iron. The local treatment consists of hot fomentations and free incision, in order to let the core or decayed tissue, and matter, escape. When the discharge ceases, the part may be dressed with simple dressing or plaster, as an ordinary sore. The sooner a free, crucial incision is made the better, and the cavity should be swabbed with carbolic acid 1 part, and glycerine 5 parts.

Internally calcium sulphide should be taken, in tablets of $\frac{1}{4}$ or $\frac{1}{2}$ grain every four hours. In every case of carbuncle the urine should be examined. If sugar is present the medicines and limitation of diet prescribed for diabetes (*see* p. 156) must be adopted.

Chaps. 'Chaps,' and roughness of the skin of the hands, chiefly occur from the cold of Northern India, which is sometimes intense, particularly during nights of the winter season. Washing in hard water is also bad for the skin. When the skin cracks over the knuckles, or elsewhere, the part is popularly said to be 'chapped.' Protection from the cold winds should be secured by gloves, and cold cream or glycerine may be applied. Many of the patent ointments are useful for keeping the skin soft and for curing cracks and sores, but vaseline or lanoline is usually sufficient.

Chilblains. Chilblains are seldom seen in India except in the cold weather of the northern districts, when they not infrequently occur to children. 'Chilblain' is the term commonly applied to erythema (*see* p. 382) of the skin over the toes, or some portion of the feet, the hands, or ears. Chilblains are caused by sudden alternations of temperature, such as warming the feet and hands, when cold and damp,

by the fire. The skin becomes red in patches, slightly swollen, and there is much irritation and itching, especially in the evening. Sometimes, owing to irritation, the parts blister, or even become a sore. Chilblains are most common in delicate women and weakly children, or in persons whose circulation is very sluggish.

Treatment. The parts should be kept warm, and therefore, unless the feet are disabled, brisk walking exercise should be taken. The part should be also painted with tincture of iodine. After washing the part take care to dry it thoroughly and, if it can be borne, vigorous friction with a towel is useful. Blisters and ulcers should be treated on general principles, and if the general health requires attention, Prescription No. 52 should be taken as a tonic.

Eczema. The term 'eczema' is too loosely used, and several skin conditions have been called 'eczema' that should not strictly be classified as such. Eczema is a catarrh of the skin, not due to external irritation, and characterised at some stage of its course by serous exudation or "weeping". Eczema is not always weeping, it may be quite dry, but at some stage there has been exudation. Usually eczema begins with more redness of the surface (erythema), then this begins to weep a clear fluid, then the discharge sets into crusts; then after a time there are no more crusts and the skin appears red, shiny, and dry, and lastly the epidermis on this part is shed in scales. So that any or all of these appearances at once may be seen in a case of eczema. The typical appearance of eczema is that of a red and weeping patch of skin accompanied by much itching, tingling, and smarting, and usually presenting in the flexures of the limbs, as the groins or armpits. The fluid in the vesicles soon becomes milky and turbid and in four or five days the vesicles burst, when the fluid is discharged and rises into thin, yellowish-green scabs. Sometimes the 'weeping' is very considerable and difficult to check. Fresh vesicles form on the surrounding skin, while the parts already affected remain sore. The duration of this malady may be from a week to months or more, and in prolonged cases the scabs become detached, leaving a sore raw surface, or they crack, exuding a clear watery fluid. In children eczema may be connected with teething, and may appear behind the ears; in women it may occur with irregular and painful monthly courses. In many cases it is thought to be caused by indigestion.

Eczema often recurs in different parts of the body at certain seasons, as the spring and *fall*.

Eczema in children and eczema of the scalp is usually of the seborrhœic or scaly form (*see* p. 398).

Treatment. Eczema should always be treated under medical advice ; it is often not an easy disease to treat and the amateur may only waste time and lose heart if he attempts it himself. Local treatment is much more important than internal. First all crusts must be removed by softening them in oil on strips of lint, then the medicaments may be applied. In the acute stage the part is not to be washed with water, nor is soap to be applied. The powder of Prescription No. 68 will be found a very useful application ; but if there is much weeping, it may get caked up. In which case wash the part first with calamine lotion, Prescription No. 15, and do this three or four times a day.

Where the pouring out of serous fluid from the eczematous surface is excessive the first dressing may soon be soaked. Remove the soiled materials and apply a fresh dressing. When you find that your dressing remains dry the chief difficulty is conquered : the part may then be treated with zinc ointment on lint.

Internally, in acute cases with much itching, small doses of antimony wine for two or three days will do good. Apart from that, and if the bowels are kept open, no other internal medicine is required, except that if the dry eczema becomes chronic, small doses, 3 minims, of liquor arsenicalis should be taken thrice daily after meals.

Erysipelas. Erysipelas is an infective inflammation of a portion of the skin and underlying tissue, due to the operations of a microbe. It usually attacks those who are out of health from constitutional debility, abuse of alcohol, bad food, neglect of cleanliness and sanitation. Erysipelas is most common on the face, which becomes shining, red, burning, and much swollen, the redness disappearing for a few seconds on pressure. Sometimes the swelling is so great that all distinctive features are quite lost. With the commencement of the redness, or previous to its appearance, there is chilliness or shivering, headache and nausea, followed by vomiting and high fever, with constipation. The redness of the skin has a raised margin more or less defined, with severe burning of the part, on which small blisters may form. Simple erysipelas as here described generally runs its course

in from ten to fourteen days, the inflammation increasing for four days, after which it declines as the blisters mentioned above form, and the skin wrinkles, and peels off.

In more severe cases there is much fever, 102° — 104° F. as shown by the clinical thermometer, and perhaps delirium. The tissues underneath the skin are also affected, there is intense throbbing pain, and matter may form; the resulting abscesses and sinuses add much to the danger, and indefinitely prolong the disease.

Erysipelas sometimes attacks wounded parts, or parts which have been subjected to surgical operation, or sometimes vaccinated arms, when the surface of the surrounding skin, or even of the whole limb, becomes red and swollen as above described. When it attacks a wound the discharge almost ceases, and if nearly healed the wound reopens. An unhealed condition of the navel renders uncared-for infants very subject to erysipelas, which spreads from the navel.

Treatment. The part affected should be covered with lint, after having been dusted over with starch or with the powder of Prescription No. 68. Or it may be painted over with tincture of iodine. The bowels must be opened either by 5 grains of calomel or by two pills of Prescription No. 62. Also Prescription No. 52 should be taken thrice daily. Benefit may also be obtained from the injection of specific sera under medical advice.

It must be remembered that this disease is infectious and the patient must be isolated and his clothes disinfected.

Erythema. Erythema means only a superficial redness, a blushing, in fact, of the skin. Such is seen in the eruptions of some fevers, or as an effect of some drugs. There are several varieties of erythema described. Thus *erythema simplex* is one, and when that condition is more transient the name *erythema fugax* is given to it. Erythema simplex or fugax consists of light red patches of various size and form, appearing in different parts of the body and generally passing away in three days or a week. There is considerable itching or tingling. It sometimes occurs on the legs of girls previous to the monthly flow. It may follow drinking cold water, when the body is heated. It may accompany teething, and in infants generally attacks the thighs and genitals. It is not dangerous and is rarely attended with fever. The bowels should be acted upon by a gentle purgative.

Another variety of erythema is *erythema solare*, or sun-

burn from exposure to the sun, especially when reflected from water. The X-rays may produce a similar erythema. No treatment as a rule is necessary ; though if the swelling and tenderness are great the evaporating lotion of Prescription No. 17 may be applied to the part by means of soaking a piece of lint in it.

In fat people and infants, opposing surfaces of skin sometimes chafe one another, such as the skin under pendulous breasts. This is known as *erythema intertrigo*. It is distinguished from eczema by the absence of weeping. The opposing surfaces should be separated and dusted with the powder of Prescription No. 68 : if necessary the surfaces should be kept apart by means of a muslin bag filled with this powder.

There are other varieties of erythema which it is unnecessary to describe here : chilblain, whose scientific name is *erythema pernio*, is described on p. 379.

Frost-bite. Severe frost-bite leads to mortification of gangrene of the part, usually the toes. But mild frost-bite is a more advanced stage of chilblain.

The first effect of the cold is to blanch the part, then dilatation of the vessels follows and the part becomes congested and looks violet. In serious cases vesicles form. In the milder cases of frost-bite care should be taken not to warm the parts too quickly. Rubbing with snow is recommended, and this must be continued till the circulation is restored. Warm socks and gloves must be worn and the skin should be painted with tincture of iodine.

Hair, Falling of the. Loss of hair may be (1) generally distributed over the scalp, or (2) in patches.

1. *General baldness* is usually a senile change, and there is nothing to be done for it. The change may occur early in life, especially in men, and a tendency to this earliness may be hereditary. Early baldness may also be a consequence of any fever or other general disease that interferes with nutrition. Apart from these causes the commonest cause of baldness is seborrhœa of the scalp (see p. 398) ; and this is evidenced as a rule by scurfiness of the head. When baldness follows a long fever, such as enteric, the hair will usually grow again, and nothing is required but cleanliness and the use of the brush, and friction of the scalp with a rough towel.

If the hair seems to be falling earlier in life than it should without evident cause, the following lotion will be found useful : perchloride of mercury 12 grains, glycerine 3 drachms

rectified spirit 3 ounces, oil of roses 2 minims, and distilled water to 6 ounces. Rub this well into the scalp night and morning. If there is sourfiness of the head, treat as for seborrhœa. But the treatment of general loss of hair is not encouraging, except when a definite cause, such as seborrhœa, can be found. In most cases it is a senile change even if setting in early.

2. *Falling off of the Hair in Patches.* If the patches are circular, and pimples are seen on the denuded part, or at the roots of the hair round it, or if hairs are seen broken, or running in an unnatural direction, *Ringuorm* is present (*see* p. 393). When no pimples are seen, and the skin of the denuded portion is quite white, it is usually the affection known as *Alopecia*. *Alopecia* may occur either on the scalp or on the face. The patches are generally small and round. The skin is white, often shiny. The hair generally falls out rapidly, but sometimes it turns grey before falling off. There is no itching as in the parasitic diseases; indeed, the bald patches are often less sensitive than the rest of the skin. The cause is not fully known, but is probably some disease affecting the nerves, or blood-supply, to the hair. So long as the roots of the hairs do not die, attention to the general health and a stimulating lotion applied locally may cure the disease. When the roots of the hairs are dead, no lotion, even the most vaunted, will produce a new crop.

Herpes. Herpes consists of a crop of vesicles along the line of one of the nerves of the skin. There are a few special forms of this eruption. It often occurs on the lips during febrile diseases, or accompanying a common cold, in the shape of five or six little vesicles on an inflamed base, which burst and form a scab. The foreskin is another part not uncommonly attacked. The number of vesicles, sometimes ten or a dozen, and the attendant itching, which is often very troublesome, serve to distinguish *herpes labialis* and herpes of the prepuce, &c., from more important affections. Less frequently, herpes occurs on the forehead, when, there is much stinging pain and numerous rings of vesicles, which, unless carefully treated, may leave a mark for life. The most serious variety is that called *Herpes Zoster*, or 'Shingles.' In this form of herpes a line of vesicles rises reaching from the spine round the lower part of the chest or abdomen to the middle line, usually on one side. There is a popular but erroneous idea that if it occurs on both sides it terminates fatally. The

eruption follows the line of the nerves in the skin. *Herpes* also occurs on the head, the nose, or over the brow. The eruption is often preceded, and always accompanied, by severe shooting pain, and feverishness. The vesicles burst about the fourth day, when scabbing takes place, the whole process lasting about a fortnight.

For the *treatment* of herpes as a rule nothing is required, except perhaps a little dusting powder over it, Prescription No. 68. Where the pain and itching of herpes zoster are severe, then lint soaked in lead lotion should be placed over the affected side exposed to the air so that evaporation may ensue. The lint should be frequently wetted in the lotion. Or evaporating lotion, Prescription No. 17, may be used instead of lead lotion. A patient with herpes zoster should be in bed.

Impetigo. Impetigo is a contagious disease, caused by pus microbes. It first causes slight itching and a red-coloured eruption, palpable also to the touch. As the eruption spreads it is not circular in shape like ringworm, but of irregular and undecided form. In about twelve hours each little red point of which the eruption is composed contains a small globule of yellowish, water fluid. This and the subsequent thicker secretion drying on the surface of the skin assume a honey-combed appearance, some part of the scab being depressed or cup-shaped, and some elevated, or presenting the appearance of concentric rings. The crust is often perforated by hairs, which do not break off so readily as in ringworm, and are consequently more easily extracted by the roots. As the disease advances the secretion becomes more thick and copious, until there may be a layer of yellowish-looking scab or crust over the whole head. When the malady has been neglected, sores and ulcers form on the scalp, underneath its scabby covering.

Treatment. The head should be poulticed and bathed with carbolic lotion (1 in 100) and olive oil, until the whole of the scabby matter is removed, and the surface is quite clean. The hair must be cut close. Then olive oil or glycerine should be applied, and the scalp should be covered with a close-fitting cap. White precipitate ointment should be rubbed in when all the scabs have been removed. The child will usually require some tonic medicine, such as cod-liver oil.

Leucoderma or 'White Skin.' This consists of white patches on any part of the body, giving, when numerous, a piebald appearance to the skin of the native. It depends

on deficiency of colouring matter. When general it constitutes the condition known as *albinism*, the eyes being devoid of pigment, and the body becoming a tawny pink. There is no known cure. It is often mistaken for *leprosy*, to which it has no relation. It is not contagious, and a good servant need not be discharged because he develops white skin patches.

When small and of short duration a patch of leucoderma may sometimes be cured by the application of strong counter-irritation, such as the regular application of iodine paint, Prescription No. 9; or the daily use of a poultice made from the native 'bachi' seeds.



FIG. 35. Female head louse, much magnified.
The real length is about 3 mm.

Lice. There are three kinds of louse or pediculus that infest man: the head louse, the body louse, and the crab louse. The first two resemble one another in appearance and size and are easily visible to the naked eye. The crab louse, which infests the pubic hairs, is smaller and is seen with more difficulty.

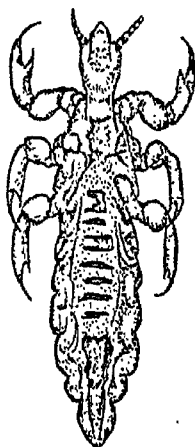


FIG. 36. Male head louse, much magnified. The real length is about 2 mm.

The same account will serve for a description of both the *head louse* and the *body louse*.

The louse is very prolific, the female laying about 120 eggs in a fortnight, the eggs hatching in about ten days' time. The louse eggs are popularly called 'nits,' and are tiny whitish goblet-shaped bodies, which are difficult to dislodge. In the case of the body louse the eggs are found mostly on the fibres of the clothes, especially along seams and linings: the 'nits' of the head louse are found attached to the hairs.

The presence of lice is usually indicated by itching: on search being made the lice or their eggs are found on the inside of undergarments or in the hair, according to the species.

The ordinary clean habits of civilisation are sufficient to keep these parasites away in normal times; but on active service, especially in winter, or under other abnormal conditions, a person of cleanly habits may become infected. Under such abnormal conditions the wearing of an undervest of butter-muslin, which has been dipped in a solution of naphthalene and sulphur, 1½ ounces each, in petrol, is recommended as a preventive. Blankets and bedding should be exposed to the sun.

If infestation with body lice has already occurred the patient should be given a hot bath, followed by change of underclothing, and immediate disinfection of the verminous garments by one of the methods given below.

The best method of preventing infestation by head lice is to wear the hair cropped close. When they are found to be present, the infested hair should be clipped very close and treated with paraffin, or petrol, or white precipitate ointment (Prescription No. 85), and then washed with carbolic soap, or the ointment allowed to remain on all night. In the case of women the cutting of the hair may be omitted, since thorough washing and careful combing with a fine comb, which should be gently warmed before use, are usually sufficient provided that the paraffin, or insecticide ointment is thoroughly applied after. Warm vinegar is sometimes useful for loosening the nits from the hair prior to combing. See also Chapter XIX.

For *disinfection of clothing and bedding* the section on disinfection of clothing in Chapter XXII should be read. If a high-pressure steam disinfector is not available, the articles may be given one soaking for one hour in a disinfectant solution of half the strength of those there mentioned. That

will be sufficient to destroy lice and their eggs. Underclothing may instead be boiled. Blankets may be covered with handfuls of flaked naphthalene scattered between them. Some garments may be ironed with a hot iron, particular attention being paid to the seams ; but this method is not very thorough.

The crab louse lives among the pubic hairs ; but occasionally wanders elsewhere. Like the other lice its presence gives rise to much itching.

The *treatment* for the crab louse is similar to that for the head louse, white precipitate ointment well rubbed over the area being sufficient to kill the lice. It is not necessary to shave the pubic region.

Lupus. There are two different skin diseases called lupus, of which the common variety is a tuberculosis of the skin. The tubercles ulcerate the skin and gradually spread, sometimes into the deeper tissues, so that they may appear to be eating away the face or whatever else the lupus has attacked. There is no object in describing the disease here, because its diagnosis requires a high degree of medical skill and its treatment necessitates constant medical supervision as well. In the *treatment* of lupus the X-rays, Finsen light, tuberculin and other highly specialised forms of treatment may be employed.

Moles. Moles are commonest on the face, neck, and trunk ; but are also met with on the limbs. They are either congenital or develop soon after birth. If they cause disfigurement or give rise to irritation, they may be removed with the knife. They should never be irritated with caustics or similar applications.

Nails, Diseases of the. Sores near the toe-nails are often very troublesome, especially when accompanied by what is termed 'ingrowing toe-nail,' when the nail grows into the flesh. It does not, however, arise from any alteration in the nail, but from the soft parts being pushed up against the edge of the nail by tight, or ill-fitting, boots. If this continues, an ulcer is formed at the root, or side, of the nail.

Treatment. The object is to remove the irritation caused by the nail. In many cases, after soaking and softening the nail in hot water, it may be filed or scraped so thin, and so much of the corner may be cut away, that the soft parts are no longer irritated. Or, by filing the nail thin in the middle, growth in that part is stimulated and the offending edge may be caused to rise from its situation. To aid this, the soft parts should also be carefully pressed away from the sharp edge

of the nail, by introducing beneath the overhanging skin a small piece of lint or lead foil, and pressing it well down towards the bottom of the sore. Persons disposed to this affection should wear their shoes loose, square at the tips, and keep their nails scraped thin and cut short. A surgical operation is necessary to cure this affection if it is at all pronounced.

An ulceration, technically termed *Onychia*, sometimes forms about the finger-nails of unhealthy children. Every such case should be shown to a surgeon, as there may be other constitutional causes at the root of this affection.

Oriental Sore. In Upper India, Mesopotamia, Persia, and other places occurs a special form of sore due to a parasite called *Leishmania tropica*. This parasite is probably conveyed by infected sand-flies, and the situation of the sores is just where a sand-fly might be expected to bite, for instance on the exposed parts, especially the face, the forearms, and the ankles. The different names that have been given to this affection are some indication of its geographical distribution; Baghdad boil, Delhi boil, Aleppo boil, and Frontier sore are all synonyms of Oriental sore.

There may be many sores at once, or only one. At first the disease is evident as a swelling but in its later stages it appears as a chronic ulcer with thickened edges. The thickened edges and the obstinacy to heal are the special features of these ulcers. They are especially liable to occur during the last three months of the year.

There are several methods of treating these ulcers. One is to scrape them surgically, and when the ulcers are many, this is usually the best thing. A mild form of treatment is by means of a compress soaked in methylene blue solution and replaced on alternate days. The X-rays, ionic treatment, antimony ointment have all been employed successfully to treat the sores, and different methods suit different cases. A vaccine has also been prepared for treatment of these sores.

Pemphigus, or Blebs. These names have been given to peculiar blisters, or *blebs*, which form on different parts of the body, especially in children. The first change consists in the appearance on the back, belly, buttocks, or limbs, of red circular spots, which itch and burn. In a few hours, at the middle of the spots, small transparent vesicles arise, which enlarge, and soon cover the whole of the red patch, excepting a narrow margin. The blebs appear in crops and

are round or oval in shape, and may attain the size of a two-anna piece, or even, occasionally, of a hen's egg. The contents at first transparent, gradually become turbid, and in two or three days the blebs burst; the place then becoming covered with a scab, under which the skin heals. Before the first blebs heal, new ones form, and the disease may continue in this manner for days or weeks.

There are various varieties of pemphigus; but the common form in India is that sometimes known as *Pemphigus contagiosus*, which at times assumes a mild epidemic character. These epidemics are usually in the hot weather, and attack the young more commonly, sometimes running through a school. It should be remembered that the blebs are contagious, as those attending to them in others may become infected. In adults pemphigus may be preceded by dyspepsia, or debility from various causes; but sometimes the patient looks and feels well throughout the attack, unless exhausted by the loss of sleep caused by the itching.

The treatment consists in attention to the general health, and in the remedy of any digestive disorders. The diet should be liberal, but meat is not to be given in large amount, and alcohol must be avoided. Local treatment consists in puncturing the blebs with a fine needle, and in protecting the parts from injury from the clothing sticking to them, by simple dry dressing. For some time afterwards a stain remains on the skin, but there is no permanent scar in ordinary cases. Of drugs arsenic is the most useful.

Prickly Heat. This is probably the first complaint a new-comer to India suffers from, and, although unattended with danger, it is very annoying. The symptoms are itching, tingling, pricking, and sweating, while the skin is covered with a bright red eruption, eventually presenting little watery heads or vesicles, some of which may afterwards contain a little white matter. The eruption is deepened in colour by exercise, or by hot drinks.

Prickly heat is much more liable to occur in a damp climate like that of Bengal than in Upper India; it is also much commoner during the rains than at any other time.

The treatment should be both preventive and curative. It is a good thing to have some antiseptic in one's bath at such times; a little phenyl will serve the purpose. Some ammonia in one's bath will help to allay itching. One should limit the amount of fluid one takes when thirsty, if subject to

prickly heat. Light clothing, temperate diet, and free action of the bowels are necessary. Avoid all flannel in direct contact with the skin. Should prickly heat occur, dry the part after washing, and freely dust it with the powder of Prescription No. 68. This will be found very efficacious.

If the condition is severe enough to give loss of sleep and irritability of temper, ten days in the hills are advisable. If this is impracticable, try taking tablets of calcium lactate internally, 5 grains four times a day, as well as using the dusting powder.

Prurigo and Itching. Intense itching, always worse at night, is the prominent symptom. It generally attacks the posterior parts or the 'privates,' but sometimes occurs in the flexures of the limbs, or on the shoulders, and back. Sometimes the parts implicated are covered with pimples, raised above the surface of, and redder than, the skin. But afterwards there is no evident deviation from the natural state, except redness or scabs produced by scratching. It is common among old people, it occurs in *diabetes* (irritation from the sugar), and in other feeble conditions. It is also a frequent complaint of pregnant women. Sores may be produced by scratching. Adults can exercise some self-control; children should be provided with loose, soft gloves, certainly at night.

The word '*Pruritus*' is used to express itching without any visible cause to account for it. The irritation may be extreme. It should be treated in the same way as prurigo, as given below.

Treatment. When local itching occurs, stimulating drinks should be forbidden, and only easily digested food allowed. Internal remedies are seldom of much use. Silk under-clothing is sometimes a help. Any evident cause such as diabetes, lice, or thread worms for itching round the anus must, of course, be excluded. Sometimes a bran bath is useful, or one containing equal quantities of ammonia and eau-de-Cologne. Or a lotion of weak liquor potassæ is sometimes efficacious; or sometimes the frequent application of 1 in 20 carbolic lotion to the part is sufficient for a cure. If that fails, procure some liquor picis carbonis and dilute it with spirit to 1 in 4 and apply locally. Or a tar ointment may be necessary, and often gives relief. For intense itching of the anus due to no apparent cause a suppository containing half a grain of cocaine is useful.

Psoriasis. Psoriasis is a chronic scaly eruption of the skin. It is found especially on the extensor surfaces of the limbs, on the back, or on the scalp. It occurs more in cold weather than in hot, and in India more on the hills than on the plains.

Psoriasis begins with little scaly raised spots. On lifting up the scale the skin is seen to be red underneath. As the disease spreads the spot grows bigger, and then the centre begins to look normal again, leaving a circular or oval margin with healthy skin inside. The margin may spread further, and the edges of contiguous patches may unite. The scales may become very thick over the patch, looking white in colour. The affected skin may itch, especially when the disease is spreading, but usually does not itch much, sometimes not at all.

Medical skill is usually necessary to diagnose this disease from others like it.

Treatment should be both general and local : and in every case should be conducted under the advice of a doctor. If the disease is not spreading, then 2 minims of liquor arsenicalis in 1 ounce of Prescription No. 35, three times a day, after meals, should be taken.

For the disease on the head and face, salicylic acid $\frac{1}{2}$ drachm, with white precipitate ointment and vaseline, $\frac{1}{2}$ ounce of each, make a suitable ointment. For the rest of the body Ointment No. 83 should be applied night and morning. This ointment permanently discolours clothes. For a tender skin, Ointment No. 83 may be diluted with equal or less quantities of vaseline.

Psoriasis does not affect the general health.

Ringworms. The ringworms, scientifically called 'Tinea,' form a group of diseases due to the growth of fungi on the skin. There are several varieties of these fungi. For our present purposes it is sufficient to describe four of their varieties under the headings :

- I. Ringworm of the head.
- II. Ringworm of the body.
- III. Favus.
- IV. Tinea Versicolor.

I. Ringworm of the head. The earliest symptoms are a little redness or scurfiness on some part of the scalp with itching ; but these symptoms most usually escape notice. Then in two or three days there are circles of minute pimples, which also may not be recognised until they, in the course of a few

hours, turn into minute vesicles. These break and discharge their contents, producing a thin scab, which may be mistaken for scurf. Fresh circles of pimples and vesicles quickly form on the outside of the first crop, the disease spreading in more or less circular-shaped patches. As the malady goes on, from the discharge consequent on the eruption, and induced by scratching, larger and thicker scabs form. Neglected 'ringworm' may thus involve nearly the whole of the scalp, these later stages being very similar to favus (p. 395). There is, however, a peculiar condition of the hairs, in the part affected, which distinguishes ringworm from any other head affection. Seen with a good magnifying-glass the hairs over the affected spot appear as if rubbed or broken off close to the scalp; the short portions remaining looking dry, lustreless, bent or twisted, split, and running in a line different from that of the healthy hairs, affording a fancied resemblance to a stubble-field. The hairs thus affected are dead; and when attempts are made to extract them they often break. When the root comes away, and is placed under the microscope, the distinctive fungus may be recognised in the shape of bright, round, cellular bodies, about $1/7000$ to $1/5000$ of an inch in diameter, collected in chains or groups. The most minute redness or scurfiness on the head of a child with itching should always be regarded with suspicion, as the possible commencement of ringworm. When there is a scurfy spot although the place is *not* red, or when there is a red spot although the place is *not* scurfy, examination with a strong glass will often show either minute vesicles, or, if at a later stage, lighter-looking portions of hair-shafts, which have escaped observation by the naked eye. If redness or scurfiness is seen on the heads of children who have been exposed to infection, the safest plan is to conclude that ringworm may be present, and to use appropriate remedies.

Treatment. The great difficulty in treatment is to reach the fungus which is deep down in the hair roots. By far the most efficient means of treatment is by the X-rays: this should be adopted if available. If not, then the means described below may be undertaken. In a case of ringworm the child should wear a skull-cap, and the head for one inch round the spot should be thoroughly shaved, not shaving the part affected. After which the great object is the removal of diseased hairs, which should be carefully extracted, one by one, with a pair of broad-nibbed forceps. Unless this is

done very gently, but at the same time firmly, the hairs will break, and the roots remain. The hairs removed should be burnt. Then the area should be cleaned ; but never wash it with water, as that tends to spread the disease. Wash with spirit or spirit and ether lotion. If very scurfy, wash with a lotion of 10 grains of salicylic acid dissolved in 1 ounce of chloroform. Then the strong tincture of iodine may be applied once daily by means of a small brush. Or, what is often better, chrysarobin ointment, as given in Prescription No. 83, should be rubbed in with the finger. If chrysarobin is not obtainable, then Goa powder may be used. Goa powder may be obtained in most Indian bazaars. A few grains of the powder should be mixed with vinegar or lime juice to form a paste of the consistency of cream, which should be rubbed on with the fingers night and morning for eight or ten days. Under the action of the Goa powder the part affected becomes whitish, while the surrounding skin is stained brown. A preparation of Goa powder known as *chrysarobin* is made, an ointment, or solution, of which may be applied with a brush. Goa powder is often adulterated. It is a fine yellowish powder without smell or taste, and it is well to see the powder, and not trust to a prepared solution. Care should be taken that neither the powder nor the solution touches the eyes, as it may cause much irritation. Goa powder is reputed an infallible remedy for Indian parasitic ringworm, but it sometimes fails, and causes considerable pain if applied to thin skin. If the ointment of Prescription No. 83 gives pain, it may be made only one-half or one-quarter this strength. If these measures are not successful use an ointment of equal parts of simple ointment, Prescription No. 86, and of unguentum hydrargyri nitratis.

Ringworm is *highly contagious*. Other children must be kept as much as possible away from the patient, and separate combs, brushes, towels, soap, and washing utensils must be provided. Clothing and bedding used by the patient should be disinfected (*see Chapter XXII*), and the soiled things should be washed separately. If ringworm occurs in a school, or large family, the first thing is to institute a regular and periodical search on all heads, and the next thing is to isolate those affected. If this is impossible the healthy should have their heads washed daily with carbolic acid solution (1 in 40), and the hair should afterwards be anointed with some kind of greasy pomade. Plenty of brushing is also a precautionary

measure of value ; and extraordinary attention should be given to ventilation of both living and sleeping-rooms.

II. *Ringworm of the body* is known among Europeans as 'Dhobi's itch.' It commences as a small, itching, scurfy spot, and, enlarging at the circumference, shows a line of minute vesicles. As this advances in semicircular patches, the skin over which the disease has passed gets well. It frequently develops round the 'fork' and waist, being determined to the latter part in natives by the irritation of the clothing worn round the body. It is from native servants that the disease is often communicated through towels or clothing. Also, no doubt, the mixing up of clothing at the 'wash' is sometimes responsible. But it may appear on the face, or in the roots of the nails, or in the beard. Ringworm of the body causes much itching, especially at night, which keeps the person awake and tends to destroy the general health, while the scratching induced causes a scaly or cracked condition of the skin, when it has been mistaken for eczema.

Treatment depends considerably on the extent of the disease. When, at first, the parts affected are small, the remedies mentioned for ringworm of the head should be used. But if early treatment has been neglected, and the disease is extensive, or the skin inflamed, the part should be sponged four or five times daily with a mixture of $\frac{1}{2}$ ounce of sal volatile in 6 ounces of water, until the remedies mentioned below can be procured. Then wash twice daily with carbolic acid soap. Then sponge with a solution of 2 drachms of bicarbonate of soda in 8 ounces of water. Afterwards rub the following ointment well in : sulphate of zinc 60 grains, lanoline 1 ounce. If this is not successful after six or eight days, use iodide of lead 1 drachm, lanoline 1 ounce. In proportion as the general health is improved, the more readily is the parasite destroyed by local measures. In chronic cases the remedies often fail to reach the actual growing fungi owing to the layer of scales, &c., over them. In such cases the skin must be well washed with hot water, soap, and a scrubbing-brush. But Prescription No. 83 will usually be found the most efficient remedy. The fungus may also be killed by means of the X-rays.

III. *Favus* is a disease caused by a fungus ; it is common in India amongst the poorer classes, but rare in England. It usually occurs on the scalp, appearing first as a tiny sulphur-yellow disc, depressed in the centre like a cup and pierced by a hair. This disc increases in size and becomes crusted over.

In the course of months if the disease is untreated the scab will come away, leaving a shiny pit permanently devoid of hair. It is not uncommon to see an Indian bald from the effect of favus. When the dry crusts are present the patient's head has a peculiar musty, mousy odour. The *treatment* must be conducted on the same lines as for ringworm of the head. The crusts must be removed by soaking them with oil, and the affected hairs pulled out : and then medicines as above recommended applied.

IV. *Tinea versicolor* is caused by a special fungus. It produces slightly raised scaly patches, which more or less fuse together. The disease is usually on the trunk only, but may be on the limbs or face. It gives a peculiar change of colour to the subject and may make an Indian appear fairer and an European darker. On an Indian the colour usually appears grey. It is quite superficial and may be scraped away to some extent. It does not affect the general health. It is contagious.

The *treatment* consists in thorough washing with soap and water and after drying, painting tincture of iodine over the part. The cure is rapid.

Scabies, or Itch. Itch commences as small vesicles less than the size of a pin's head, generally between the fingers, afterwards spreading to other parts. It is caused by an insect, which burrows under the skin. This creature is called *Acarus scabiei*, and is round in shape, varying from one-seventh to one-quarter of a line in length and breadth. The female, being larger than the male, is sometimes visible to the naked eye as a greyish-white, moving atom. Under the microscope it presents a tortoise-like shape, and is found to be studded with hairs and bristles, the head terminating with strong jaws. With these the female insect burrows through the thinnest part of the upper layer of the skin, selecting such spots as the space between the fingers, or the inner aspect of the wrist and arm, where the skin is thinnest and softest. Once buried it does not come out again, but burrows within the skin, where young *acari* are produced, which in their turn burrow and reproduce their kind. These burrows may usually be seen in the shape of dotted or zigzag marks on the skin, looking like faint needle-scratches. The itching produced is often intolerable, especially at night. After itch has continued some time, and been neglected, and irritated by scratching, matter may form and the burrows become open sores.

A person with itch should be isolated. The parts affected should be first *well* washed with ordinary soap and water, which opens the burrows, and then *well* rubbed twice daily with sulphur ointment, Prescription No. 87. This is best done first at bedtime, holding the hands in front of a fire the while. .

When the hands are affected, they should be well washed and rubbed with the ointment, and then inclosed in gloves or a bag of oiled silk all night, and the rubbing repeated in the morning, after a good washing with soap and water. Beyond opening the bowels if confined, no internal treatment is necessary. The clothing of persons with itch should be burnt, or disinfected, by baking in an oven at a temperature of 140° Fahr., or by the fumes from burning sulphur (*see* Chapter XXII). Scabies in small children is often on the legs: they are to be treated similarly with half strength sulphur ointment.

Success in the treatment of itch depends on the care and thoroughness with which the measures are carried out. If the rubbing in is done morning and evening, and the parts not cleaned meanwhile, all the insects should be killed in three days. But half-measures are no good, and will allow the disease to go on for weeks.

Seborrhœa. Seborrhœa is a condition of over-activity of the sebaceous glands, leading to alteration as well as increase of their secretion. It is most commonly seen on the scalp. On the heads of infants seborrhœa may give rise to dirty-yellow greasy masses of epithelium. In adults such an appearance is rare; here the disease is shown by dry powdery scales. It is, in fact, the condition that is responsible for the shower of scales (dandruff) from the head when the subject brushes his hair. There is sometimes itching accompanying it. Seborrhœa is responsible for a good deal of baldness.

Seborrhœa may also occur on the face and body, and is indeed not uncommon there in India, but usually the disease begins on the scalp. On the face and body there are commonly seen cakes of greasy scales with a reddish base on the skin and a fringe of papules about the edge. On the body, the patches often form ring shapes. There is also a disease called seborrhœic eczema, which is only eczema attacking skin that has long been the seat of seborrhœa. This disease begins also as a rule in seborrhœa of the scalp.

Seborrhœa in no way affects the general health, and local measures alone are required for its treatment.

Treatment. The scaly masses must first be removed by washing with soap and water. Then gently rub in with a little brush, a lotion composed of half an ounce to an ounce of precipitated sulphur, in 8 ounces of distilled water, care being taken to touch the hair as little as possible. Bedtime is the most convenient hour for this; but in severe cases it should be done twice daily. Precipitated sulphur in cold cream in the proportion of 1 to 10 makes a good pomado, and if the hair is falling the addition of a drachm of tincture of cantharides to each ounce of the pomado is useful. On the body a stronger application is required, and the ointment of Prescription No. 87 may be applied.

Perseverance is often necessary for success in the treatment of seborrhœa of the scalp; but, if neglected, the subject will tend to lose his or her hair sooner than without treatment.

Sudamina, or Miliaria. An eruption of numerous minute watery vesicles, seldom larger than a pin's head. *Miliaria* is the term generally given to this affection when the skin appears also reddened. It affects the sweat glands and occurs during most diseases which are accompanied by much perspiration, as fevers, acute rheumatism, and inflammation of the lungs. This condition is caused by the little ducts from which the perspiration oozes becoming clogged by dirt or the secretions of the skin, and it is usually seen on the bodies of patients who have been kept too warm, or whose skins have not been sufficiently cleaned. The eruption presents principally about the neck, chest, and armpits. It is of little consequence, but indicates that the patient requires a cooler regimen and greater cleanliness of the skin. It is important that it should not be mistaken for the specific eruptions of certain fevers.

Any toilet powder, or the dusting powder of Prescription No. 68, will form a suitable application.

Ulcers. Ulcers are raw open sores, generally hollowed out lower than the surrounding skin, which may result from any inflammation of the surface of the body, as, for instance, from boils, or from injuries. Ulcers of a peculiar kind are caused by tuberculosis, syphilis, cancer, and certain parasites.

Chronic ulcers of the legs are common in elderly people, and are frequently caused in the first instance by varicose veins (*see* p. 364). Ulcers require different treatment according

to their cause, or condition. The most universally suitable application is boric ointment, Prescription No. 82, spread on lint. Any ulcer that does not show signs of healing as soon as treatment is undertaken should be shown to a doctor.

A special form of ulcer, liable to occur on the nose or near the eye, is called a *Rodent ulcer*. It has malignant characteristics, and for its treatment either removal by the knife, X-rays or radium is necessary.

Another special form of ulcer is described under the name 'Oriental Sore'.

'*Urticaria*', or 'Nettle Rash'. An eruption resembling in appearance, and in the accompanying stinging pain, the condition of the skin produced by nettles. But sometimes the rash commences as long white wheals, surrounded by a red band or margin, as if the part had been struck by a cane. The rash frequently appears suddenly; may last only a few minutes, or for a day or two, and may disappear as suddenly; or it may vanish in the daytime, returning at night. There is severe itching, or tingling, which may be alleviated by applying sal volatile 1 part, water 2 parts, or by applying weak ammonia. From the sudden manner in which it occurs, sometimes attended with vomiting and feverishness, urticaria often excites alarm; but it is not dangerous and often depends on improper diet. In some persons it follows eating shell-fish (mussels), strawberries, cucumbers, or mushrooms. In India it is not uncommon to find it resulting from a meal of tinned fish, particularly tinned salmon. Urticaria sometimes follows an injection of serum given by the doctor for some other condition and it may then give the patient a most distressing night of itching. Sometimes nettle rash follows drinking cold water when the body is heated. If the attack follows soon after a meal and is accompanied by nausea or vomiting, it is best to give an emetic, Prescription No. 30. In other instances give Prescription No. 60, 1 ounce thrice daily. If the rash is at all persistent, take 5 grain tablets of calcium lactate thrice daily. Some cases are chronic and some frequently recur; this is especially the case in neurotic women. Such should avoid all stimulating food and alcohol, and keep the bowels freely open. Many such are benefited by a course of the sour milk (lactic acid bacillus) treatment. A sea voyage is sometimes efficacious when other means fail.

Warts. Warts are of various kinds, though their nature is the same. Warts give rise to no symptoms, except such as

may arise from their size or situation, such as difficulty in holding a pen, &c.

Ordinary warts may be successfully treated by applying salicylic acid in the form of a plaster or dissolved in collodion, 1 drachm to 1 ounce, and then applying chromic acid, Prescription No. 7, to the base of the growth.

If this fails, then surround the skin round the wart with a thin layer of vaseline and apply by means of a probe, first pure carbolic acid, and then strong nitric acid to the wart. It will then fizzle away.

A larger wart may be snipped off by the scissors and after a little pressure to stop immediate bleeding its base may be treated as described above.

CHAPTER XI

AFFECTIONS OF THE EYE AND EYELIDS

Foreign Bodies in the Eye. These can often be removed by means of the corner of a handkerchief, a camel's-hair brush, or a feather. In cases where removal is difficult, if the lower lid be drawn down, the foreign body may often be gently stroked down on to it from the eyeball and then along the inner surface of the lid to the inner angle of the eye, and there removed. These parts are less sensitive than the eyeball and so less discomfort is caused.

It is often possible to remove a foreign body from one's own eye by the aid of a mirror or polished surface such as the inner case of a silver watch.

By raising the upper lid and drawing it down over the lower lid, and allowing the lids to separate themselves, a foreign body may be dislodged and removed. Opening and shutting the eyes under water is often effective also. Blowing the nose vigorously sometimes assists removal.

Frequently the foreign body is lodged under the upper lid, where it can be felt by patient. To remove it the eyelid must be turned inside out. This is done by placing a blunt knitting-needle or a match on the middle of the eyelid horizontally, seizing the lashes with the fingers, telling the patient to look towards his feet, and then turning the lid back over the match. This will expose the inner surface of the lid, when the foreign body will be seen and can be removed. No harm can be done by this proceeding with ordinary care, and it may save patient hours of suffering.

Foreign Bodies in the Cornea. Sometimes sharp particles, such as chips of iron from the bar of a tonga in India, become embedded in the clear central part of the eye (cornea). At first the discomfort is felt chiefly on opening or shutting the eyes. On careful examination in a good light, a small particle may be seen lying in the clear substance of the cornea. The use of a magnifying-glass makes the examination easier. Such cases should wherever possible be treated by a surgeon. It is not advisable for lay persons to attempt

removal of the foreign body, as they may damage permanently the delicate cornea by so doing.

Where no surgeon is available, put one drop of pantocaine lotion (Prescription No. 100) into the eye. Wait two minutes and then touch the body with a piece of clean blotting-paper. This may effect removal if, as is sometimes the case, it is only very lightly embedded in the cornea. The touching must be done very gently to avoid damaging the cornea. Relief from the discomfort will be afforded by the pantocaine, but it must not be repeated for this purpose, as it damages the cornea.

If removal is not effected by this simple proceeding, nothing further should be attempted. After a day or two the particle will become loose and probably come out of itself.

Meanwhile the eye should be bathed with boracic lotion (Prescription No. 93) twice a day and the eye kept closed with a pad, secured by a bandage. A small quantity of ointment of yellow oxide of mercury 1 per cent. (Prescription No. 95) should be applied at night. This should be continued for a day or two after the foreign body has come out or been removed.

Injuries to the Eyeball. The eye may be damaged by a blow. This frequently happens during games in which a ball is used. A wound may be caused requiring, obviously, immediate surgical attention, but more commonly little or nothing wrong with the eye is seen. The sight may appear blurred. In many cases the eye is simply suffering from concussion due to the force of the blow, and in a few days or less will recover perfectly. It must always be remembered, however, that if the blow has been a severe one some damage may have been done to the delicate structures in the interior of the eyeball. This is especially liable to be the case if the sight is very blurred and there is pain in the eye. In all such cases, therefore, it is advisable that the patient should lie down for the rest of the day and apply a handkerchief dipped from time to time in cold water, to the eye. If there is any tendency to bleeding inside the eye this will arrest it. If the sight is dim the next day, the eyes should not be used, and protected from light. If the dimness of vision does not clear up in a few days some damage has probably been done to the interior of the eye. In such cases of injury it is always advisable, therefore, to seek medical advice early, to ascertain the extent of the injury. If none is obtainable the eyes should

be rested and the sound eye not used for fine work or reading till a month has passed : if then it causes pain in the other eye, reading must be discontinued for a further period.

Affections of the Eyelids. *Stye (hordeolum).* A stye is caused by inflammation occurring in one of the small glands of the eyelids. A red spot appears on the margin of the lid ; at first it may only irritate a little, but later becomes painful. In severe cases the whole lid becomes swollen. It should be frequently fomented with hot water, permitted to come to a 'head,' and then pricked with a sterile lancet or needle. If an eyelash grows from the centre of the stye, the hair should be pulled out with pincers. This may evacuate the matter and save pricking the stye. Hot fomentations should again be applied. If the patient has several styes in succession, especially if they are associated with pimples or boils, it indicates a poor state of health or an error of refraction requiring spectacles. The general health in such cases may require attention. Constipation, if it exists, must be counteracted. A tonic containing iron is often useful (Prescription No. 52). The vision should be tested by an eye specialist.

Sore Eyelids or Blepharitis. Acute inflammation of the eyelids may be caused by any of the causes which lead to inflammation elsewhere in the body, such as erysipelas, and should be treated according to the cause. Bites of insects such as the mosquito frequently cause a great swelling of the lids, so that the patient cannot open his eye. This usually clears up in a day or two without any treatment. An application on a piece of lint of Prescription No. 94 will assist in reducing the swelling and discomfort. The lint should be again dipped into the lotion when it ceases to be moist and should not be covered, except by a single turn of bandage to secure it, as constant evaporation of the lotion is beneficial.

Chronic Inflammation of the lid. Various forms are met with, the simplest of which is simple redness of the lid margin due to exposure to heat, as in the case of cooks, or due to excessive smoking, bad atmosphere, etc. It is often due to defective eyesight, especially in children of school age. It may be due to parasites such as the 'crab' louse, which on close examination may be seen, or its eggs may be detected attached to the roots of the lashes. Chronic ophthalmia (see p. 409) and defective general health may also cause this condition.

Apart from simple redness of the lid margins mentioned two chief forms are common. In one of these, the 'scaly' form, small white scales like dandruff accumulate among the lashes; in the other, the 'ulcerative' form, yellow crusts glue the lashes together. On removing the crusts, small ulcers which bleed easily are seen around the roots of the lashes. The lashes in both forms become loose and fall out. In the 'ulcerative' form they are often not replaced, causing disfigurement.

Treatment. The same treatment is required in both forms, but must be more thoroughly and energetically carried out in the ulcerative form.

The scales or crusts must first be removed by washing with bicarbonate of soda and warm water, a teaspoonful to half a pint. The crusts, being softened by the washing and lotion, can now be gently rubbed off by means of a small piece of cotton-wool. Yellow ointment (Prescription No. 95) should be now well rubbed into the surface previously covered by scales or crusts, for several minutes. The weakest ointment may be tried first and if not effective the stronger one should be used. In more severe cases, or if above treatment does not suffice, the raw surfaces left after removing the crusts (ulcers) should be well painted with a solution of protargol the strength of which should be 10 to 15 per cent.

The general health should be attended to in all cases. The sight should be examined by an oculist if possible. If lice are the cause of the condition, rub blue ointment (*unguentum hydrargyri dilutum*) or sulphur ointment into the lid margins twice a day.

Watery Eye, or Overflow of Tears (Epiphora). There is a communication between the eyes and the interior of the nose by what is known as the lachrymal sac and duct, the minute entrance to which (*puncta lachrymalia*) may be seen at the inner corners of the eyelids. The duct conveys the tears from the surface of the eye to the interior of the nose, and if the passage be blocked, watery eye results. Blocking of the duct is frequently caused by an eyelash, but may be due to dirt, small chalky concretions, or masses of fungi. The opening may be closed by the contraction of a wound. Watery eye may also be caused by displacement of the *punctum lachrymale*, owing to facial paralysis or blepharitis. In old age the lower lid becomes flabby and by falling down exposes the

orifice of the duct to cold, which produces congestion and also by altering its position, prevents its receiving the tears.

Very rarely the punctum lachrymale is absent at birth. Newly born children occasionally have watery eye owing to blocking of the tear passages by epithelial cells, which should have melted away at birth.

Watery eye must be treated with reference to the cause. If a hair can be seen with a magnifying-glass in the inner corner of the eye in one of the puncta lachrymalia, it must be picked out with a forceps. The other conditions require surgical treatment, but astringent drops (Prescription No. 89 or 90) will afford temporary relief.

In cases where the 'watery eye' is caused by a permanent blocking of the duct into the nose, inflammation sometimes takes place inside the lachrymal sac, and a painful swelling forms just below the inner corner of the eye. This may subside, or matter may form, giving rise to an abscess. Fomentation with hot water may relieve the inflammation and avert an abscess. If it does not, surgical treatment is required.

If, therefore, there is reason to suspect blocking of the duct, medical advice should be sought.

Ophthalmia (Conjunctivitis). This term implies inflammation of the membrane (conjunctiva) covering the eye or lining the eyelids. There are several varieties. In mild cases the inflammation may not extend beyond the surface of the white of the eye, which is injected with red vessels, running in different directions and not straight from the centre towards the circumference as described under Iritis. There is a smarting feeling as if sand or grit were in the eye. There is intolerance of light, and the eye is watery and weak. In the case of children, if the attack is moderately severe it is kept obstinately shut. There is also pain in the forehead or head generally. There is a 'discharge' from the eye, at first clear and thin, but afterwards thicker and of a yellowish-white colour. During sleep this discharge collects at the edges of the lids and dries there, gluing together the eyelashes. One or both eyes may be affected; one eye is often affected first and the other afterwards if proper care is not taken to protect the healthy eye.

In all cases, but especially if there is a discharge from the affected eye, the healthy eye should never be touched with anything that has been in contact with the affected eye, in order to avoid spreading the infection if the disease is

due to micro-organisms. After touching the affected eye, patient should cleanse his hands and dip them in an antiseptic lotion (Prescription No. 18, diluted with four parts of water).

The severer forms of this disease are caused by micro-organisms which get into the eye. It is very common in children, and is often brought about by contact with older children suffering from the disease or by children using a common towel. Foreign bodies, burning acid, ammonia, cold, straining at fine work, stings, exposure to irritant smoke or gas, and alcoholic excess also cause it.

In the East it must always be remembered that trachoma which is described later in this chapter, often commences as simple ophthalmia. It is particularly necessary, therefore, in all cases of ophthalmia in the East to guard against spreading the disease to others. Each person affected with ophthalmia, therefore, should have a separate towel, soap, water, and washing-basin.

The severer forms of the disease at first sight may appear like the purulent form to be described later, but may be distinguished from it often by the fact that in the simple form the yellow 'matter' collects chiefly in the eyelashes and in the corners of the eyes, but when the eye is opened yellow matter does not pour out from the eye, as is the case in the true purulent form.

Treatment. Patient should wear a shade of dark-tinted glass if there is intolerance of light, but should not be kept shut up in a dark room, as is often done. Light is unfavourable to the growth of micro-organisms, which cause many forms of eye disease, and tends to help the healing process. If the light is not too powerful, as in the East at certain times in the day, patient should be allowed to go out of doors as soon as he can comfortably do so. It should be particularly noted that neither in this nor in any kind of ophthalmia (conjunctivitis) should the affected eye be closed with a pad and bandage. This stops the discharge from coming out, and by doing so may cause serious damage.

In the mild forms where there is not much discharge and the eyes are not very painful, bathing the eye with equal parts of boracic lotion (Prescription No. 93) and water three or four times a day will usually be sufficient to remove the trouble. It may be noted here that in the absence of distilled water, which is preferable on account of its freedom from

dissolved impurities which may irritate the eye, rain-water, if clean, is preferable to tap or well-water. It should be filtered and boiled before use.

If there is much discharge, especially if it is yellow in colour, the eye should be well washed out three to six times a day according to the severity of the case with magnesium sulphate lotion (Prescription No. 101). This washing out is best done by means of an irrigator or undine, procurable from a chemist, or a tea-pot or kettle with a narrow spout. Plenty of fluid should be used, as the mechanical cleansing by the fluid is of great importance. For convenience the patient should lie supine on a form with the head slightly over the edge. The operator holds the lids open with the fingers of the left hand and directs the stream from a height of 6 to 12 inches.

If the eyelids are swollen, red and painful they should be fomented as well, twice or thrice a day.

The lids should be anointed each night with chloretone ointment (Prescription No. 102) to prevent their sticking together; if they adhere, they should not be forced apart but should be bathed till they separate.

A purgative should be given (Prescription No. 62) if the bowels are confined.

A chronic form of ophthalmia is often kept up, especially in those who use their eyes for much reading or fine work, by eye-strain, due to defective sight. The provision of suitable glasses will remedy this.

Purulent Ophthalmia (Conjunctivitis). This is a condition which demands immediate and careful treatment. It results from the introduction of virulent micro-organisms into the eye. A very dangerous form of this disease results from the discharge passed in gonorrhœa, being introduced into the eye. A gonorrhœa patient may infect his own eye, or infection may be caused by using a towel which has been previously used by such a patient. It may be contracted by infants from the mother during labour. It is highly contagious, and the nurse should always thoroughly cleanse her hands and disinfect them in antiseptic lotion (Prescription No. 18, diluted with four times its bulk of water) after handling the case. The inflammation is very severe; the 'whites' of the eye may become so swollen that the middle, clear part of the eye (cornea) is almost hidden (chemosis). The discharge contains a great deal of yellow 'matter' (pus). In

some cases the inflammation may spread to the deep parts of the eye and the eye may be lost (*pan-ophthalmitis*).

Treatment. To prevent this disease the eyes of infants should be well washed with boracic lotion (Prescription No. 93), and if there is the slightest suspicion that the mother may have had a vaginal discharge at the time of birth one drop of nitrate of silver lotion (Prescription No. 98) should be dropped into each eye. This disease accounts for a very large proportion of all blind people in Europe. The use of the above remedies will prevent it and cannot in any way injure the eyes. If only one eye is affected, the other eye should be protected by being covered with a watch-glass fixed between two pieces of sticking-plaster and stuck over the eye. A small piece of rubber tubing should be fixed beneath the watch-glass at the lower and outer part. This is to allow of ventilation, and is particularly necessary in a hot climate. If not done the eye cannot be properly observed and the glass becomes hazy, and the eye also becomes irritated. Except at this part the eye should be completely sealed off. The plaster must be constantly looked at to see that it does not get loose, to avoid any discharge getting under it. Persons looking after the patient must be very careful to avoid any of the discharge getting into their eyes, and should wear special large glasses to prevent this. It is essential to wash away the discharge from the interior of the eye. Potassium-permanganate lotion (Prescription No. 19, diluted with ten times its bulk of boiled water) or magnesium sulphate lotion (Prescription No. 101) should be used for this purpose. The washing is best done as described in previous section. The syringing must be done very gently to avoid damaging the front of the eye (cornea), which may be very much softened. The irrigation must be done every two hours by day and every four hours by night. The lids should be held open so that the fluid can get into the eye, but in doing so the greatest care must be taken to avoid force, as the cornea may thereby be damaged. If this happens serious damage to the sight or loss of the eye may result. After each irrigation a few drops of argyrol solution. (Prescription No. 103) or silver solution (Prescription No. 98) should be dropped into the eye and the lids should be well anointed with 1 per cent. yellow oxide ointment (Prescription No. 95) or chlorotone ointment (Prescription No. 102) to prevent their sticking together. In applying any

form of lotion to the eye, the lower lid should be drawn down and the lotion dropped into the eye, preferably by means of a glass medicine-dropper. If not obtainable, a fountain-pen filler or a quill may be used. They should be placed for a short time in boiling water before use. A clean piece of cotton-wool also may be used; it should be soaked in the lotion and then the lotion may be squeezed out, a drop at a time. For the relief of pain apply hot fomentations frequently. If they do not give relief, a piece of lint dipped in ice-water may be used. The dressing should be laid over the eye and secured by a very loose bandage, so as to allow the discharge to pass out of the eye. Hot applications are preferable to cold, as cold tends to devitalise the tissues and interfere with nature's process of healing. The patient should be kept in bed. The head of bed should be away from the light and both eyes should be protected from light by a shade. The bowels should be kept open (Prescription No. 27 or 62). It may be necessary to give a sleeping draught if patient is very restless (Prescription No. 29).

The strength should be maintained by plenty of good and easily digested food and by tonics if required (Prescription No. 52).

When the acute stage has passed off a few drops of a 15 per cent. solution of protargol should be dropped into the eye twice daily till the discharge ceases. After that astringent drops (Prescription No. 90) should be used.

This being a very dangerous disease, a doctor must always be called in early if possible.

Granular Ophthalmia or Trachoma. This is often called 'granular lids' in the East, but the name should be avoided as all cases popularly called granular lids are not true trachoma. Many are only chronic ophthalmia of a simple nature, whereas trachoma is a very serious disease, on account of the difficulty in curing it and the loss of sight which often follows it. True trachoma is characterised by the formation of granular bodies, resembling minute sago grains, in the inner surface of the eyelids. After a time the disease may spread to the front of the eye (cornea). The sight of the eye is then affected owing to the formation of blood-vessels and opacities in the clear substance of the cornea. Ulcers frequently form (*see* p. 411) and the sight of the eye is frequently permanently damaged, or the eye may be lost. This disease is very common in the East, and is one of the

chief causes of blindness there. It is contagious and runs through whole families. If a person in the East has a discharge from the eye which does not yield to the treatment described under Simple Ophthalmia, he should be suspicious of its being trachoma and consult a surgeon. The treatment of trachoma consists in the application of caustics and other means, which cannot be carried out by the patient himself, or by a lay person, without special instruction.

Phlyctenular Ophthalmia (Phlyctenular Conjunctivitis). In this form of ophthalmia one or more small, round, grey or yellow nodules are seen in the conjunctiva just outside the clear margin of the cornea. They are raised above the level of the rest of the conjunctiva, or what is commonly called the 'white' of the eye. This disease is most common in young children, especially in delicate children. It is frequently associated with tuberculous enlargement of the glands of the neck. If the condition has lasted some time there is great intolerance of light and the eyes are kept tightly closed. This renders treatment difficult at home, and therefore medical advice should be sought. If medical treatment be not obtainable the eye should be bathed frequently with warm boracic lotion (Prescription No. 93). A small piece of yellow oxide of mercury ointment two per cent. (Prescription No. 95) as large as a hemp-seed should be taken up on the tip of a clean finger and placed on the inner surface of the lower lid, which should be drawn down and turned out by the other hand. The upper lid should then be gently rubbed over the eyeball with the tip of a finger for two or three minutes. This should be done twice or thrice a day. To carry out the application of the ointment, it may be necessary to sit down and fix the child's head firmly between the knees, while a second person, sitting opposite, supports the child's body on his lap and holds the hands.

The general health of the child must at the same time be attended to. Cod liver oil in the form of emulsion may be given three times a day (Prescription No. 47.)

Angular Ophthalmia (Angular Conjunctivitis). In this disease the margins of the lids, especially at the inner and outer angles of the eye, are reddened moist and pasty and may appear scurfy if the disease has lasted some time. If not treated the disease may last for months or years. It is due to a special micro-organism, and can be cured by bathing the eyes first with boracic lotion (Prescription No. 93) and then

dropping in zinc lotion (Prescription No. 90) four or five drops twice daily.

Ulcers of the Cornea, or clear central part of the Eye. [Commonly called the coloured part (blue, brown hazel, etc.), the colour being due to the iris which lies behind the clear cornea and is seen through it.] These may result from an injury, neglected ophthalmia, and other causes. They are common in phlyctenular and granular ophthalmia. The 'white' of the eye presents more or less the injected appearance described in simple ophthalmia, but in addition, if the ulcer has lasted some time, one or more red vessels may be seen stretching from the margin towards the centre of the cornea, in some part of which a small, rough-looking, white spot (an ulcer) will be discovered. This spot will contrast markedly with the clear polished glass-like surface of the cornea round it. The patient often feels a pricking sensation as though there were a piece of grit in the eye. There is also much intolerance of light (photophobia) and watering of the eye. In bad cases several of these spots may form. If the case proceeds favourably, the white of the eye loses its injected appearance, the red vessel or vessels in the cornea disappear, and the ulcer heals, often leaving a scar seen as a white film, which may or may not disappear in time. When the disease does not progress favourably it may lead to further damage to the eye: eventually leaving a larger film in the cornea (opacity) interfering very much with the sight. In still more severe cases the cornea is converted into a white mass of scar tissue and the person cannot see at all. In some cases the ulcer may make its way through the cornea, and a hole is made through which the iris protrudes. As a further result, cataract, or inflammation, leading to a loss of the whole eye, may result. It is necessary, therefore, that ulcers of the cornea should be treated with great care.

If the ulcer is the result of one of the ophthalmias above noted, the treatment for the particular ophthalmia must be carried out in addition to special measures for the relief of the ulcer.

Treatment. In any case of ulceration hot fomentations afford relief and should be applied several times a day. The eye will stand a considerable amount of moist heat. The patient may be kept in a slightly darkened room while there are symptoms of photophobia. Frequent irrigation with

magnesium sulphate lotion (Prescription No. 101) in an eye bath (Prescription No. 96) is an effective method of treatment in any form of ulceration. The washing may be carried out very frequently during the day, the oftener the better.

Atropine is most useful in ulceration of the cornea but should not be used except under the directions of a doctor, as it provokes glaucoma in certain cases. The dilatation of the pupil and rest for the eye produced by atropine is so valuable in corneal ulceration that if a doctor is not available homatropine ointment (Prescription No. 99) may be used. If the pupil is small and irregular this is more necessary until the pupil dilates. In cases of bad ulceration however it is important to see a doctor and get advice as to the use of atropine.

Unless there is much discharge from the conjunctiva the eye should be kept bandaged. A small piece of yellow oxide of mercury ointment (Prescription No. 95) may be placed between the lids before covering the eye with a piece of lint, a pad of wool and a bandage.

As the ulcer heals the dread of light and profuse secretion of tears will diminish. The hot fomentations may then be discontinued, but the frequent washing should be persisted in. When the ulcer is covered with smooth epithelium gentle massage at the time of putting in the yellow oxide ointment will accelerate the clearing of the opacity. During the course of treatment it is always well to put an ointment into the eye when the patient retires to bed.

Iritis. This term signifies inflammation of the iris, or that part of the internal eye in which the dark round ring of the pupil is situated. Its colour determines the colour of the eye. In this disease, while the minute blood vessels in the white of the eye immediately surrounding the cornea are injected, the cornea itself is clear. Through the cornea can be seen the iris, which after a time tends to become discoloured, turning greyish if naturally dark, greenish if naturally blue. The pupil tends to be contracted and sometimes becomes adherent to the lens behind it at various points. It is then no longer circular but irregular. It may become blocked up by a yellowish exudate. In some cases a yellow deposit forms and collects in the lower and front part of the eye behind the cornea (hypopyon). The symptoms of iritis are pain, often of a neuralgic character, both in the eye and in the bone around the eye, intolerance of light, and dimness of

vision. The causes of iritis are : injuries, gonorrhœa, syphilis, tuberculosis, gout, and rheumatism. Iritis also occurs without obvious cause in people who are in a poor state of health. A chronic form may be associated with infection of the teeth and tonsils.

The chief danger of iritis is the liability to fixation of the pupil by adhesions. This may cause serious permanent damage to the eye. Dilatation of the pupil with atropine will prevent this.

Treatment. The eye should be protected from light by a pad and bandage. The intolerance to light may be relieved by darkening the room. Hot fomentations should be applied frequently. The patient may be given aspirin (10 grains) thrice daily and the bowels should be freely opened with Prescription No. 65 or 92 at night on two or three occasions at intervals followed next morning by a saline purge (Prescription No. 27) or a seidlitz powder. Atropine is essential in the treatment of iritis if adhesions between the iris and other structures are to be prevented, but as mentioned before it is sometimes dangerous to use atropine owing to the risk of producing glaucoma. If no doctor is available and the eye is soft and the pupil irregular and immobile the risk of giving atropine ointment may be taken. Should it give relief it may be persisted with, but should it cause a great increase of the pain it must be stopped. It may be obtained from any Government dispensary or chemist with directions for use. Atropine not only prevents adhesions, but it also puts the internal muscles of the eye at rest and relieves pain ; hence its value. In cases with adhesions in which the pupil does not dilate properly but is seen to be irregular, mercury may be given internally (hydrargyrum cum creta 2 grains, twice a day as a powder or Prescription No. 92) in addition to the local treatment.

Iritis being a serious disease, medical advice should always be sought early. It is very important to determine the cause in each case. If medical advice cannot be obtained and there is reason to believe the disease is caused by gonorrhœa, syphilis, tuberculosis, or any of the causes mentioned it is absolutely necessary that the general treatment of these conditions (q.v.) should be carried out at the same time as the local treatment described.

Glaucoma. This is a disease in which the pressure inside the eyeball becomes higher than normal. This tends, if not

relieved, to destroy the nerve of sight and cause incurable blindness. The symptoms are attacks of dimness of vision. The patient sees things but dimly as through a mist. This may last from a few hours to a day or two. Headache in back of head and perhaps vomiting may accompany the dimness. The sight may then become all right again and remain so for some days or months, but another attack sooner or later will occur. Sometimes the patient sees bright flashes of light, or coloured halos round lights. After one or two attacks of dimness of vision the sight is usually found to be more or less damaged. There is a diminution of the field of vision as if a cloud obscured some portion of it. In some cases, after the above-described symptoms have lasted for a time, the patient may be seized with severe pain in the eye or with neuralgic headache, usually worse on one side than the other.

These symptoms may also come on at once without any of the symptoms first mentioned. The cases in which there is no pain or only slight headache may be called the 'simple' form, those in which there is severe pain the 'acute' form.

Treatment. It cannot be too strongly emphasised that glaucoma is a most dangerous disease, and that if medical advice is not sought at once in the acute form, the sight of the eye may be lost permanently in a single day. If, therefore, there is a suspicion of acute glaucoma, seek medical advice instantly. The quiet form is equally deadly as regards its power of destroying the sight, and advice must always be sought early, though there is not the same vital necessity of seeking it at once as in acute glaucoma. If no medical advice is available, or pending its arrival, in the simple form two drops of eserine lotion (Prescription No. 97) should be dropped into the eye twice a day till the pupil is about as small as a No. 6 shot or the symptoms are relieved, and once a day afterwards till medical advice can be obtained. The instillation of the lotion may cause an uncomfortable feeling in the eye for a time, but this must be expected. It can never do any harm in a doubtful case and should be used. It will keep the eye in a safe condition till advice can be obtained. In the acute form three drops of eserine lotion (Prescription No. 97) should be dropped into the eye every half an hour, and the eye bathed with hot water till the pain is relieved and the pupil gets small. After that eserine lotion can be used every four hours till the eye quiets down and loses its redness. Eserine lotion should then be used once a day to keep the pupil small, till

medical advice can be obtained. In the acute form the patient must be kept absolutely at rest in bed till the acute symptoms pass off. A purge (Prescription No. 27) should be given and repeated next day. In the simple form the patient should keep quiet and avoid exposure to sun or wind, but the room must not be darkened. He need not remain in bed, but should not read or do any fine work.

Cataract. This condition is caused by the lens of the eye becoming more or less opaque, so that light can no longer pass through it normally into the eye. This causes interference with vision, the amount of which varies according to the degree of opacity of the lens. The lens is a clear structure resembling glass, situated behind the central circular opening in the iris, called the pupil. In the healthy eye it cannot be seen and the pupil looks black. When the cataract is fairly advanced it can usually be seen through the pupil giving the latter a white or bluish-white colour. It must not be confused with the white scar left by a corneal ulcer (*see* p. 411). This is situated in the clear glass-like cornea, whereas the cataract lies deeper behind the pupil. Cataract may be present at birth or may develop later in life. It is most common in old people. Occasionally it is caused by an injury to the eye.

In the early stages of the disease nothing wrong can be seen on looking at the eye. If, however, an elderly person whose glasses previously suited him finds he cannot get a pair which suit him, that he sees better with weaker glasses, or that he sees best in twilight or with his back to the light, cataract should be suspected. Cataract is considered by the general public as a very terrible disease, but as a matter of fact glaucoma and other diseases are far more dangerous. Cataract can be cured in almost every case by an operation, whereas glaucoma and other diseases, if neglected, destroy the sight entirely. Many surgeons allow the cataract to ripen before operating. This means the patient must wait a varying time, from six months to, in some cases several years. A warning here is necessary. The process of ripening of the cataract is entirely free from pain or discomfort of any kind in the eye. If any pain or discomfort arises the patient should at once seek medical advice, as in some cases glaucoma (*see* p. 413) supervenes in a ripening cataract. If this should happen and not be recognised, the optic nerve will be damaged and the operation for cataract will fail to restore the sight.

Further, a quiet, insidious form of glaucoma is often thought by a patient who has not sought advice to be cataract, and he waits, hoping to have it removed when ripe. When he seeks advice it is only to be told it is too late and that the sight is lost. This is exceedingly common among the uneducated masses in India. To avoid this, in all cases of failing sight medical advice should be sought early to determine the cause.

Spots before the Eyes (*Muscae Volitantes*). People sometimes see black specks or branching lines before the eyes. The specks often appear to move, passing usually from above downwards. They are especially visible when looking at a white surface or the sky. They often cause considerable anxiety, as the patient thinks they indicate serious eye disease, but this is not so. A purge (Prescription No. 62) occasionally and a reduction in the amount of food together with regular exercise may remove the trouble. Occasionally such spots are associated with actual disease of the eye. In this case the spots will be more constantly seen, whereas the others vary very much from time to time. A single spot may also appear, which is always seen in a certain position. This may indicate breaking of a small blood-vessel in the eye or some local disease of the retina. In all these conditions, if the sight is any way diminished it increases the probability of there being some actual disease of the eye. In such cases medical advice should be sought.

Balls of light, zig-zag lines, and other appearances commonly precede an attack of 'sick headache' or migraine. Occasionally flashes of light are a symptom of early glaucoma.

Affections of the Nerve of the Eye (Optic Nerve). The optic nerve and its expansion in the retina are subject to various maladies. The ophthalmoscope has enabled surgeons to differentiate the nervous affections of the eye, which are now variously designated in accordance with the appearances discovered by ophthalmoscopic examination.

Affections of the nerve of the eye may be caused by syphilis, diabetes, albuminuria, tubercle, severe hæmorrhages, malaria, and tumours of the brain. The nerve may also be implicated in inflammation starting in the eye, or in the nerve or its covering behind the eye. Exposure to bright light, such as looking at an eclipse of the sun with the naked eye, may also cause damage to the nerve of the eye.

Symptoms which may be expected are : dimness of vision,

distorted vision, sparks or flashes of light, narrowing of the field of vision, perhaps loss of portions of the field as if by a cloud in front, and sometimes night-blindness. Any such symptoms demand early professional advice. In the mean time the eyes should be rested as much as possible; they should be protected from bright light, and any general malady should be treated.

There is a special form of affection of the optic nerve caused by the excessive use of tobacco. The patient notices that his sight is getting worse, and this is more marked in the daytime or in a bright light. He finds that, though glasses may help a little in some cases, he cannot find a glass with which he can see as well as he did before. If the patient looks straight at a small red or green patch it may appear to him colourless, whereas if he moved it about before his eye it may appear coloured. The size of the patch should be not larger than a pin's head. This condition is called tobacco amblyopia. Individuals vary very much in their susceptibility to tobacco. The presence of diabetes or the use of alcohol predisposes to this condition. Usually it is met with only in fairly heavy smokers or people who chew tobacco a good deal.

The only remedy is to give up at once the use of tobacco. It must be absolutely given up. The use of even what is to the patient a ridiculously small amount is enough to keep up the condition. Alcohol, if taken, should be given up also. It must be noted that the disuse of tobacco will almost invariably effect a cure if the disease occurs for the first time. Patients, when they are cured, should never return again to the use of tobacco, as they are very liable to get another attack. A second attack may cause serious permanent damage to the sight.

Poisons such as lead and carbon disulphide, used in India-rubber works, may also cause disease of the optic nerve. Wood spirit is particularly dangerous.

Defective Eyesight. It has been pointed out in the course of this chapter that defective vision is a symptom of many eye diseases. Apart from these, there are several conditions in which the sight of the eye is not normal. Normally the eyeball is of a certain length, and the different parts of the eye—the cornea, lens, &c.—so act on the light entering the eye as to focus the rays correctly on the retina. This focussing apparatus is a necessity for the production of distinct vision. Under certain conditions the structure of the

eye may be so altered that light is not under all conditions accurately focussed on the retina. This gives rise to defective sight. Four chief varieties are common.

Short Sight (Myopia). In this condition a person can see objects near to the eyes, but distant objects are seen indistinctly or not seen at all, according to the degree of short sight. If a child says he cannot read the writing on the blackboard at school, and if he holds his book closer than is usual to the eyes whilst reading, he probably has short sight. The condition if neglected gets worse, and the sight may be permanently damaged. Liability to short sight is often hereditary, and parents who are short-sighted should be on the look-out for it in their children.

Treatment. Proper glasses of the concave variety are required. In cases of short sight in young people an oculist should always be consulted, as it is usually necessary to examine the eye under the influence of atropine. By this means the tendency of the patient to choose glasses which are too strong, and which therefore injure the sight, can be eliminated. A short-sighted child should only be allowed to read in a good light and not allowed to hold the book too close to the eye. If the short sight can be prevented, as it possibly can be, from increasing till the child is grown up, there is then little danger of its getting worse. If the condition is not treated the short sight may get steadily worse and permanent damage to the eye may also result.

Hypermetropia. This is often wrongly called 'long sight' by the laity. The error arose because in this disease there is trouble in reading or in doing fine work, whereas the patient sees distant objects quite well. He does not, however, in the most favourable case see them better than a person with normal sight, but usually sees them less distinctly.

In slight cases the only complaint often is that the eyes get tired after reading for some time, or that after reading for a time the print becomes blurred. Headache also may be caused by much reading or close work. In worse cases the patient will not be able to see very fine print, and his distance vision may be affected. A patient may have had hypermetropia for years and not be aware of it. This is because under favourable conditions the internal muscle of the eye is able to counteract it, but if the conditions are unfavourable it can no longer do so and the defect becomes apparent. Hypermetropia, therefore, may only be noticed when a patient

passes the age of thirty to thirty-five, or if he has much work to do, as in studying for an examination, or after an illness.

Treatment. The remedy is the use of suitable glasses of the convex variety. In slight cases it is sufficient to wear them only for reading, in other cases it may be necessary to wear them constantly.

Astigmatism. This condition often causes great discomfort. The symptoms are the same as those of hypermetropia, just described, but pain in the eyes and headache are more frequent.

Treatment. The use of proper glasses of the cylindrical variety will give relief.

Presbyopia. When a person whose sight has been normal all his life passes the age of forty-five years, he usually notices a tendency to hold his book further away whilst reading, and difficulty in seeing small print, especially by artificial light. This is due to a loss of elasticity in the lens of the eye. It is a natural occurrence, just as it is for the hair to turn grey, and need cause no alarm. It is remedied by using glasses of the convex variety for reading only. As age advances stronger glasses will be required. After sixty there is only a slight change in the sight. It must be emphasised that patients who are suffering from chronic glaucoma (*see* p. 413) often notice a more rapid failure of their sight and buy stronger and stronger glasses, with the result that when they come to an oculist the sight has been permanently damaged. Any rapid weakening of the sight for near vision in a person over the age of forty-five should lead him to consult an oculist. If ordinary presbyopia is present a change of glasses once in five years till 60 is often sufficient, but if people have much reading to do a lesser change may often be made with advantage every two years. If the glasses need to be changed oftener than this, provided correct glasses were last prescribed, the patient should be on his guard against the occurrence of some other disease in his eye.

In all cases of defective eyesight patients are warned against purchasing glasses in a shop that seem to suit them. They are very apt to buy unsuitable ones, which may injure their eyes. They should consult an oculist and get a prescription for the glasses best suited to their particular case.

Squinting. A squint may be either single, double, or may alternate. It depends upon want of equilibrium between

the muscles which move the eyes, or on paralysis, injury, or diseases of the nerves.

Squint in Children. There is a widespread belief among the laity that squint may be caused by improper placing of the cradle with regard to the light, or from a child constantly looking at an object to one side of its cradle. It is also commonly attributed to imitation of a person who squints. It must be clearly understood that these and all similar explanations are erroneous. Children below the age of two years often squint when looking at near objects, because they have not learned to use both eyes together. In such cases the squint will not be constantly present, but only when a child is looking at a near object, and will affect either eye. This will pass off as the child gets older. It must be realised, however, that very young children of six months and upwards do develop squint, which if neglected may become permanent. If, therefore, an infant squints constantly, it is well to seek medical advice. A child may squint only when it is not well or in the course of a severe illness. This is due to nervous irritation, and will be remedied by attending to the general health.

Too much stress, however, cannot be laid on the fact that the chief cause of squint in children is defective eyesight, and that if taken in hand at once it can be cured. If neglected it will become permanent. The child's eyes should be examined by an oculist. If glasses are prescribed, it must be clearly understood they must be always worn from the minute the child gets up in the morning till it goes to bed at night. A second pair of glasses should always be kept ready in case the child breaks the first pair, as leaving off the glasses for a day or two will undo the good of months of constant wearing of them. If the case is taken in hand early and these precautions are taken there is every chance of the child being permanently cured, though glasses may have to be worn till it is grown up or always.

It is possible in many cases to improve the condition by an operation even in a case which has not been so treated or to cure it permanently if it has not lasted too long. 'Treatment should be undertaken in the first six years of life if binocular vision is to be saved. No greater mistake, however, can be made, as is so often the case, than that of 'waiting till the child is older and then getting the eyes put straight,' a remark which parents often make! The eyes can be 'put straight,' but if the squint has lasted a long time the sight

of the squinting eye, from want of proper use, becomes weaker than that of the other and in fact may become quite blind. The sight of the eyes being unequal, they cannot be used together properly. Even if not blind at the time of operation the better eye only is chiefly used, and the result as regards the improvement of sight is *nil*.

In adults squint is usually due to affections of the nerves of the eye, or damage to the eye. The treatment depends upon the cause.

CHAPTER XII

DISEASES OF THE EAR, NOSE AND THROAT

DISEASES OF THE EAR

Eruptions on the Ear : Deafness : Earache : Wax in the Ear : Boil in the Ear : Foreign Body in the Ear : Inflammation of External Ear : Acute Inflammation of Middle Ear : Chronic Discharge from the Ear.

1. Eruptions on the Skin of the Ear, or behind the Ear. These ' breakings-out ' usually occur in children during teething and generally take the form of eczema. They may also occur in adults. Much pain is not felt in these cases. In these cases, cleanliness must be particularly attended to, otherwise the skin affection may run into sores. In these cases soap and water should be carefully avoided. The ear should be wiped with a clean cloth and a little olive oil or ' calamine cold cream.' Cleanliness and treatment are essential, otherwise they assume a more prolonged and inveterate form.

2. Deafness. Deafness occurs in every degree, from mere dulness of perception of sound to absolute insensibility. It is not itself a disease, but a symptom of some disease of the ear. It may depend on obstruction to the outer passage of the ear, to injury or disease of the drum, to disease of the middle ear, to disease of the nerve of hearing, or to obstruction to the passage leading from the ear to the throat.

If it comes on without any obvious cause in an otherwise healthy child or adult, the presence of a mass of wax in the external passage may be suspected. Quinine in the large doses necessary for cure of malarial fever may cause temporary or permanent deafness accompanied by noises in the head. Adenoids and enlarged tonsils, by causing blocking of the passage leading to the throat, are a fairly common cause of deafness in children, and a cold in the head may produce the same effect.

In the absence of the simple causes I have mentioned, a medical man should be consulted before any treatment is undertaken.

3. **Earache.** Earache is also a symptom, and the common causes in India in otherwise healthy people are : (1) a boil in the external passage ; (2) inflammation occurring as the result of accumulated wax. In children earache may be the first indication of an attack of mumps or of a sore throat. Again, a decayed tooth or the cutting of a wisdom tooth may cause earache. The pain may also be an indication of inflammation of the external passage or of the middle ear, always a serious affection. The situation of the pain is a good indication of whether the cause is likely to be a serious condition or not.

The pain of ordinary earache is located in the ear itself, below it, and in front of it ; it is frequently made worse by moving the jaw. In serious middle-ear inflammation, on the other hand, the pain is felt behind the ear and on the side of the head ; moreover, if the bone immediately behind the ear is lightly tapped with the finger, pain is felt in the bone. When this symptom is present no time should be lost before seeking medical advice. In the slighter forms of earache the dropping in the ear of a few drops of olive or other sweet oil warmed in a teaspoon can do no harm and is generally very soothing. The ear should never be syringed in these cases without a doctor's advice. Hot fomentations will relieve the pain. For this, hot bran or salt placed in a bag of suitable size, should be used as it is more effective than hot water.

4. **Accumulation of Wax in the Ear.** When such an accumulation has grown large enough to block the passage and cause deafness or earache it can be seen as a black or brown mass if a good light is directed into the ear. To remove it a drop or two of glycerine, oil, or hydrogen-peroxide should be placed in the ear at night, which will soften the wax, and the following morning the wax can usually be syringed out.

In syringing an ear, the ear should gently be pulled upwards and outwards and the stream of water should never be directed straight into the passage, but against the top or bottom or one or other side, and in removing wax the direction of the jet should be changed from one side to another. After the wax has been washed out, the ear should be dried with cotton-wool and then a piece of the same material should be kept in the ear for half an hour. This prevents inflammation. If wax collects often, it can be prevented by

inserting a few drops of hydrogen-peroxide into the ear once a fortnight.

5. Boil in the Ear. This occurs in the external passage, and when near, its opening can be seen as a raised, red, pointed projection. It causes great pain and tenderness of the ear. Sometimes the gland behind the angle of the jaw becomes enlarged from the effect of the boil. In these cases, chewing is very painful and the ear is very tender to the touch especially in front.

The pain is often accompanied by a slight watery discharge. It usually lasts three or four days, after which time the boil bursts, there is a slight discharge of pus or matter, and the pain ceases. The discharge continues for a few days longer and then stops.

Treatment. A purgative dose and the application of hot fomentations to the ear will assist in rapidly bringing the boil to a head. When the boil has burst the ear should be gently syringed daily to clear out the discharge, and a piece of cotton-wool soaked in ichthyol in glycerine ten per cent or glycerine carbolic five per cent, placed loosely in the opening. As an alternative, the inside of the ear may be dusted with boric powder. This treatment should be continued until all discharge has stopped. If these attacks recur, a doctor should be consulted.

6. Foreign Body in the Ear. Children sometimes thrust small bodies such as beads or seeds into the ear, and such foreign bodies may perhaps not be discovered until they have set up inflammation, shown by redness, pain, heat, and swelling in the passage and discharge from it.

No attempt should be made to extract the intruder with a hairpin or any other instrument. The ear should be syringed. The stream of water will wash out the foreign body. The syringing may have to be persevered with until ten or twelve syringefuls of lotion or warm water have been used. If it is not then effective skilled aid must be called in.

7. Inflammation of the External Ear occurs in children or adults as the result of some irritation. This irritation may be dirt, wax, foreign bodies, or caused by too forcible cleansing of the ear passage by the corner of a towel or other such means adopted by unwise nurses. Sea-bathing also is a very common cause.

The symptoms are pain in the ear itself, in front of it, below it, and pain on moving the jaw. The lobe of the ear

may be red, hot, swollen and tender, but is not always so. In a day or two a discharge occurs, which, however, does not relieve the pain.

In young children the discharge may be the first recognizable sign of the disease. Infants who have pain in the ear only show it by crying and putting the hand to the ear and by refusing to lie on the side.

Treatment. Pain may be relieved by hot fomentations preferably bran or salt. To an adult 10 grains, and to a child 2 to 4 grains, of aspirin may be given.

Discharge should be washed away twice or thrice daily with warm boric-acid lotion (Prescription No. 14) from a syringe, the passage then gently and carefully dried with a twist of absorbent cotton and some boric powder blown in. A small piece of cotton-wool should be placed loosely in the opening of the ear.

If improvement, shown by a lessening of the pain and discharge, does not occur after two or three days of this treatment, skilled advice should be sought.

8. *Acute Inflammation of the Middle Ear* is a very serious disorder, and its treatment outside the scope of domestic medicine. The illness begins with very acute throbbing pain in the ear and side of the head behind and above the ear, accompanied by high fever, which perhaps follows on a shivering attack. Deafness is also a marked symptom. After twenty-four to seventy-two hours the drum of the ear may burst and the pent-up matter escape. This escape of the matter relieves the pain but the internal structure of the ear may be destroyed. If the matter does not escape externally the inflammation may extend into the bone of the head or into the brain.

Treatment. Before the case is seen by a doctor the treatment should be limited to application of leeches behind the ear, the administration of a purgative, and to hot fomentations.

9. *Chronic Discharge from the Ear* may result from acute inflammation of either the external or middle ear. It leads to many complications which it would be out of place to describe in a work of this kind. In all such cases a medical man, and preferably one who has made a special study of ear diseases, should be consulted.

The treatment necessary is generally long and tedious but if patiently and conscientiously carried out will in any

but very severe cases lead to eventual cure.

It is very important that all cases of discharge from the ears should be very carefully treated as otherwise it may lead to serious and fatal complications.

DISEASES OF THE NOSE

Adenoids : Bleeding from the Nose : Foreign Bodies in Nose : Hay Asthma : Polypus of the Nose : Worms in the Nose.

Adenoids. Adenoids consists in the overgrowth of the lymphoid tissue, such as the tonsil is formed of, that normally exists at the back of the nose above and behind the palate. As this tissue is of similar nature and function to the tonsils, enlargement of the latter commonly accompanies the growth of adenoids and both are liable to occur, especially in children. The symptoms produced by adenoids are mainly those of obstruction to nasal breathing. The mouth is generally held half open to allow the patient to breathe through it, and for a similar reason he snores during sleep. The nostrils become drawn in and the nose thin and pinched, and the general picture of the child is typical and easily recognisable as 'adenoids' by those who have once seen it. The children often look stupid, and may in fact be backward at school. This is partly because they cannot hear a good deal that goes on, since deafness often results from spread of a chronic catarrh from nose to ear. Similarly also taste and smell may be affected. In bad cases that have persisted for long there may arise much deformity of the chest owing to the child's being unable to take a really deep breath, the ribs in consequence being drawn in.

The adenoids may be felt by passing the finger up and behind the palate.

In any case where a child habitually wears its mouth open or snores at night, or seems to have its nose stopped up, a doctor should be consulted. If the child be seen early the condition may be remedied by tonics, fresh air in the hills or at the seaside, and respiratory exercises; but very often by the time the doctor sees the case the time has passed for such measures, and surgical removal of the adenoids, together usually with the tonsils, is necessary. The condition should certainly not be neglected, as the child may become permanently affected not only in his respiratory organs,

but mentally as well. (*See also* 'Chronic tonsillitis' on p. 435).

Bleeding from the Nose. This may result from injury, or it may occur from a plethoric or too full condition of system, or, on the other hand, from a thin, poor state of the blood, as happens in scurvy or as the result of venereal disease, fevers, malaria, and kidney or liver disease. It may also occur as a consequence of polypus (*see* p. 429). If the bleeding arises from a blow it will probably stop after a few minutes on the application of cold water to the face and back. If it continues from any cause, some dilute hydrogen-peroxide may be sniffed up the nose. In all cases of obstinate bleeding from the nose the body should be kept in the upright posture, and the hands should be raised and held by other persons above the head. The patient should breathe through the mouth. A bladder of ice or a cold wet cloth may be applied to the forehead and back of the neck, a piece of cold metal, as a door-key, to the back; and pressure should be made over the facial artery by pressing the finger in the angle formed by the side of the nose and cheek. The nostrils should be pressed together with the thumb and fingers for half an hour. The feet and legs may be placed in hot mustard and water. In some cases the blood may not pass from the nostrils, but, proceeding from the back of the nose, may trickle into the throat and be swallowed or spat out. If faint, the patient must lie down.

If bleeding from the nose depends on too full a condition of system, recurring perhaps periodically, low diet, purgatives (Prescription No. 27), especially if costiveness is present, are the proper remedies. Moderate bleeding from the nose may be regarded as salutary when the person is red-faced, plethoric, and subject to headache or giddiness. It is then an effort of Nature to relieve herself, and, unless violent, should not be suddenly restrained. Bleeding from the nose frequently occurs in children, and in some cases a thin condition of blood is the case, and the complaint must be treated accordingly, *see* 'Anæmia', Chap VI. If bleeding depends on a polypus the growth should be removed (*see* p. 429). In obstinate cases of bleeding the nose may be irrigated by means of a large-sized catheter, one end of which is placed in one nostril and to the other end fitted a glass or tin funnel. With the head slightly bent forward and the mouth open, a solution of cold salt and water

or Hazeline may be poured into the funnel; the water will then pour out of the other nostril and the mouth. Or the nasal douche may be employed.

Cold in the Head. See p. 140.

Foreign Bodies; in the Nose. Pens, beans, seeds, small stones, slate-pencil, insects, &c., may be thrust into the nostrils by children or may be accidentally inserted. Attention is generally drawn to these cases by a discharge from one nostril, which makes the upper lip sore and has a bad smell. The foreign body may be frequently discharged by compressing the clear nostril with the fingers and then blowing forcibly through the obstructed nostril. In some cases, the foreign body can be taken out with a forceps. But it is best to call in a doctor, especially one skilled in this work, as the children are usually uncontrollable and an anaesthetic and special instruments may be necessary to remove the foreign body. After the foreign body is removed, the nose should be kept clean for a few days by syringing with weak boracic lotion, strength, one drachm to a pint of warm water. If a leech gets into the nose, a solution of 2 drachms of salt in 2 ounces of water should be sniffed up or a douche employed.

Hay Asthma. This disease is often called hay fever and pollen fever: but is not a true fever, and hay asthma is a better name, because the condition in the nose has resemblances to that in the bronchial tubes in true asthma. Like asthma, hay asthma often runs in families.

Some persons possess a peculiar, ill-understood, nervous irritability of constitution, with irritability of the nasal passages to particular atoms floating in the atmosphere. While some persons are affected when hay is ripening, others are not affected from hay, but suffer when certain other plants bloom. It is perhaps most frequently excited by hay pollen, and occurs, in England and India, more especially during the hay harvest. The symptoms are spasmodic sneezing (which is sometimes the chief or only symptom), watering of the eyes, feverishness, cough and expectoration, and sometimes spasmodic attacks of difficulty of breathing resembling true asthma.

The sufferer from hay asthma should take an early opportunity of consulting a rhinologist or nasal specialist, because in many cases a simple local treatment of the nasal mucous membrane may cure or relieve his symptoms. If this is not successful he should avoid agricultural districts where

the pollen causing the disease is most prevalent ; mountain air is usually the best. If the condition is troublesome the specific antitoxin treatment for hay asthma should certainly be tried and a doctor consulted for the purpose. During an attack the local application of adrenalin chloride, 1 in 1000 solution, to eye and nose will often give relief. So sometimes does the local application of cocaine in tablet form, a tablet containing $\frac{1}{6}$ grain being introduced into each nostril. Or the use of Ferrier's snuff, consisting of morphine hydrochloride 1 grain, powdered acacia 1 drachm, bismuth subnitrate 3 drachms, may give relief. But the last three remedies should not be used without medical advice, and certainly not persisted in until all the previously mentioned means have been tried.

Polypus of the Nose. A polypus is a pear-shaped tumour growing from a more or less marked pedicle or stem. The most usual positions are the ear, the nose, the lower gut, the female privates, and, less frequently, the throat. Polypi may be soft, gelatinous, and light in colour, or comparatively hard, fleshy, and red. Polypus of the nose causes a feeling of stuffiness in one or both nostrils, sneezing and discharge, and snoring during sleep when the mouth is kept wide open. Taste and smell are impaired and the speech becomes thick and nasal, all the symptoms being aggravated by damp weather. When one nostril only is affected, on stopping it by pressure with the finger, the person breathes well through the other. As the polypus grows it may present as a more or less reddened or pearly white semi-transparent tumour at the entrance of the nostril ; or it may hang through the posterior nostrils into the throat, causing constant 'hawking' and spitting. Sometimes the patient feels the tumour flapping to and fro with the breathing, or it may be heard moving. It may cause bleeding from the nose. The *treatment* of a polypus consists in its surgical removal.

Worms in the Nose. The affection generally described as worm in the nose, is in reality maggots in the nose. It is a malady almost entirely confined to the lower class of dirty people. A species of fly enters the nostrils and deposits larvæ or eggs, which eventually become maggots. If any disease causing discharge from the nostrils exists, the flies are attracted, and are likely to effect entrance. Anyone may daily notice flies clustering about the eyes and nostrils of unclean beggars, particularly children, the latter taking

little trouble to rid themselves of the nuisance. At such times, or during sleep or weakness from disease, the flies enter the passage, and maggots in the nose is the result. A good application is carbolic acid lotion (1 in 60) or a mixture of turpentine and water, injected by means of a syringe. When visible, the maggots should be extracted with forceps. Maggots may also be present in the ears, the symptoms and treatment being the same.

DISEASES OF THE THROAT

Foreign Bodies in Throat and Gullet : Sore Throat: Pharyngitis,
Acute and Chronic : Laryngitis, Acute and Chronic : Tonsillitis,
Acute and Chronic.

Foreign Bodies in the Throat and Gullet. People are sometimes choked, and have been killed, by false teeth or portions of food sticking in the gullet and preventing the air passing into the windpipe. As in Fig. (37), showing a section of the parts, the windpipe (1) and the gullet (2) lie close together, the entrance to the former being protected by a little valve, A, the *epiglottis*. This remains open and upright except when the act of swallowing is performed, when it shuts down over the opening into the air-passage or *larynx*,

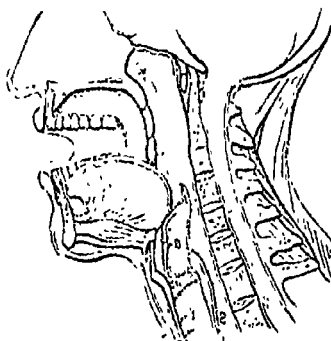


FIG. 37. Showing relation of air passage
(largest) marked 1 to food
passages or gullet marked 2.
A. Epiglottis. B. Larynx.

B, allowing the food to glide over it. When a person eats quickly or carelessly, pieces of food may pass beneath the valve into the windpipe, a circumstance popularly spoken of as 'going the wrong way'; or a piece of food may lodge

above the gullet and epiglottis, shutting the latter down, and thus producing suffocation. This may happen when masticating stringy meat. Two pieces may be attached like chain shot; one piece is swallowed while the other remains entangled in the teeth, and the connecting string shuts down the little valve at the top of the windpipe and stops the breathing. The effects are spasmodic cough, protrusion of the eyes, blood or froth issuing from the mouth and nose, the person turning blue in the face and falling down insensible.

Treatment. Place the patient where the best light falls from a window or lamp into the mouth, and then boldly and quickly examine the back of the throat and the base of the tongue by passing the forefinger well down. If necessary the teeth must be forced and kept open by a piece of wood or handle of a knife. Probably the foreign mass may be touched and hooked up if a hard body, or pushed down if a soft one, with the finger. This will be facilitated by directing that the tongue be put forward, well out of the mouth, and there retained, being grasped by the patient's own fingers (if conscious) covered with a handkerchief. This procedure mechanically draws forward the arches of the palate and allows the operator to sweep his finger well across from one side to the other of the throat. If the finger does not reach the foreign body a sharp blow on the back should be given with the flat of the hand. If the patient is a child, it will add force to the blow if the child is taken between the knees, so as to compress the belly; otherwise much of the impetus of the blow is lost by transmission to the yielding walls of the abdomen. Or the child may be held up by the heels, and inversion sometimes succeeds in dislodging the offending body. Thus fish-bones or other bones or various foreign bodies lodged high up in the gullet may often be removed by the fingers. They may be brought up by vomiting, occasioned by passing the fingers into the throat in their search, or they may sometimes be dislodged by pressure with the fingers outside. Hard angular, or pointed substances, such as false teeth and teeth-plates, should always, if possible, be got up, and in some instances they may be laid hold of with a long pair of curved forceps. But softer substances, when lodged low down, may sometimes be impelled onwards into the stomach by swallowing large pieces of food, or they may be ejected by an emetic (Prescription No. 30). If necessary, apply artificial

respiration (see p. 325). If there is complete obstruction to swallowing, the doctor or if possible a specialist should be called in.

Foreign Bodies in the Windpipe cause sudden pain, violent, and a fit of choking, accompanied by intense pain. Should the body not be got rid of by the sufferer's own efforts a fatal result may ensue. If not immediately fatal, the spasm may subside and the body be retained in the windpipe and produce little or no symptoms; there may only be slight cough or slight pain. Notwithstanding this, the patient is in reality in danger, and the body should, if possible, be removed. For this purpose medical aid should be sought without delay. In children, even when no history can be obtained, a sudden suffocation should raise the suspicion that a foreign body has got into the windpipe. In the presence of a sudden suffocative attack due to the entrance of a foreign body into the windpipe, the helper will act as for a foreign body in the throat and gullet.

Sore Throat. The term 'sore throat' is a popular one used to express any painful disease of the throat. It is necessary for us to be more explicit and to name the disease according to the part of the throat most affected. The disease may be :

- (a) in the pharynx, or upper part of the throat ;
- (b) in the larynx, or lower part of the throat, whence the voice is produced ;.
- (c) in the tonsils, two lymph-glands which are situated one on either side of the pharynx.

Each of the above parts may be inflamed, and in any case the inflammation may be acute, that is to say, of short duration and rather severe, or chronic, which is of longer duration and tends to be less severe. The accounts of sore throat will be found, therefore, under the headings Pharyngitis, Laryngitis, and Tonsillitis.

Pharyngitis. *Acute pharyngitis* occurs in the course of many infectious diseases, though in some, such as scarlet fever, the inflammation is mostly confined to the tonsils. When acute pharyngitis occurs alone it is usually due to cold and part of a catarrh involving the nose, and often the larynx as well. There is usually slight fever, but the disease only lasts a few days ; it tends to be more severe if the tonsils are affected, when the treatment should be as given for acute tonsillitis.

Chronic pharyngitis may follow repeated attacks of acute pharyngitis, and is common in heavy smokers, alcoholics, or those who have to use their voice much, as clergymen. In alcoholics it is a particularly unfortunate affection, because it often renders the mucous membrane dry and so gives rise to a feeling of thirst, which the unfortunate man tries to relieve by more alcoholic drink. The voice is often hoarse, but this is when laryngitis exists as well.

In *treatment* the cause must be ascertained and managed accordingly. No tobacco can be allowed, and the food should not be spiced. The general health must be attended to; and relief can be sometimes given by sucking potassium-chlorate lozenges or other simple or astringent pastilles, such as eucalyptus and red gum pastilles. The affection, however, is a very obstinate one.

Laryngitis. *Acute laryngitis* is usually due to catching cold or the inhalation of an irritating atmosphere. It often accompanies catarrh of other parts of the respiratory passages, such as coryza or bronchitis. First of all a feeling of tickling in the larynx is experienced, and then the voice becomes hoarse and there is a cough. Sometimes the voice may be completely lost. In children the symptoms may be severe, because the catarrhal swelling of the mucous membrane may cause almost complete stoppage of the air passage in their small larynges. There is usually not much fever except in a child.

There is as a rule not much difficulty in diagnosing acute laryngitis except sometimes in a child, where the symptoms will resemble those of laryngeal diphtheria. If there is a false membrane (*see* Diphtheria) to be seen elsewhere in the throat the diagnosis of diphtheria will be clear, but sometimes there is not, and diagnosis then may be difficult.

For *treatment* absolute rest of the voice must be enjoined: no talking, except in a mild whisper. If the disease is severe the patient should be in bed. A moist atmosphere is beneficial, and a bronchitis kettle will give much relief. If there is fever, then 2 minims of tincture of aconite in 1 ounce of Prescription No. 41 every four hours will assist. In the absence of a bronchitis kettle steam inhalations (*see* p. 592) in which some turpentine or eucalyptus oil may be employed are useful. Hot fomentations on the outside of the neck help to ease the pain; but if symptoms of obstruction to breathing

occur they may better be eased by the application of cold externally in the form of finely chipped ice.

Chronic laryngitis. The commonest cause is over-use of the voice, especially shouting in the open air. Excessive smoking may also cause chronic laryngitis ; chronic alcoholism also. There are other types of chronic laryngitis due to syphilis and tuberculosis, but we are dealing at present only with the simple forms.

Hoarseness of the voice is the principal feature of the disease, sometimes complete loss of voice.

In every case of chronic laryngitis a doctor should be consulted early, and an examination by the laryngoscope is advisable. It is necessary to make sure that the disease is not tuberculous and to exclude other causes of laryngitis, and this can only be done by a doctor. If the laryngitis be of the simple type the voice must be rested absolutely. Clergymen must abstain from preaching for a lengthy period. Tobacco and alcohol must be avoided. Chronic pharyngitis often accompanies this condition, and the chlorate of potash lozenges and pastilles recommended for that should be used here also. If the services of a doctor are available he will also be able to apply medicaments locally to the larynx.

Tonsillitis. Tonsillitis may be acute or chronic.

Acute tonsillitis, apart from its occurrence in the course of one of the infectious fevers, may result from cold or be rheumatic in nature, or, most commonly of all, be due to infection by some micro-organism. In the latter case a predisposing cause is often a condition of generally lowered vitality resulting from fatigue, as, for instance, the over-worked doctor or nurse is more likely to be infected from some patient than when in full vigour, and so they get the familiar 'hospital throat'. There are two varieties of acute tonsillitis :

(a) When the disease is superficial, either giving rise to mere redness or, with general enlargement of the organs, giving much suppurative exudation of yellow-white colour. This exudate is usually in tiny patches, but the patches may meet and cover the entire tonsil. The temperature is high, the glands in the neck are often enlarged, and the patient feels very ill. This is called follicular tonsillitis, and affects both sides.

(b) When the inflammation is more intense inside the tonsil and there suppurates, forming an abscess inside accom-

panied with much swelling, usually much more on one side than the other. This is called a 'quinsy,' and cure is obtained when the abscess bursts or is opened.

The *treatment* of acute tonsillitis should commence by giving to an adult either two pills of Prescription No. 62 or 3 grains of calomel. If the tonsillitis be not severe, and especially if of the rheumatic type, relief may be obtained by taking 2 minims of tincture of aconite in 1 ounce of Prescription No. 58 every four hours till the temperature falls, or by 10 grains of acetyl-salicylic acid every three hours. Potassium-chlorate lozenges should also be freely sucked. In addition the throat should be gargled every hour or so, either with the chlorate gargle Prescription No. 21, or with glycothymoline 1 part to 3 parts of warm water. Instead of gargling, and especially for children who cannot gargle, the application of this chlorate solution by means of the spray or the glycothymoline solutions by means of the nebuliser (*see* p. 596) is indicated.

Where there is 'quinsy,' *i.e.*, an abscess formation as described under (b), the abscess should be opened by means of a guarded knife; but if a doctor is not at hand this should not be attempted. Meanwhile the same treatment as for tonsillitis should be adopted, both the medicine and the spray or gargle. In any form of acute tonsillitis relief will be obtained by frequent hot fomentations on the neck; but if the swelling of the tonsils is so great as to threaten suffocation, relief will be obtained rather by cold applications for the time, ice externally and ice to suck.

Acute tonsillitis may be a serious disease, and is often accompanied by high fever, pains in the joints, and other signs of severe illness, but the soreness of the throat is severe enough to direct attention to the tonsils and make the diagnosis. The exudate over the tonsils may be so great as to resemble the membrane of diphtheria (*see* p. 47), and some cases can only be diagnosed by a bacteriological examination.

Chronic tonsillitis. Chronic tonsillitis is a common affection, especially in children, and is often accompanied by adenoids. In this disease the tonsils are large and pale in colour. Attention is usually directed to the child's tonsils by the frequent recurrence of sore throats. During the sore throat the tonsils are large and red, and the condition is one of acute tonsillitis; when this acute inflammation has subsided the tonsils remain large and are liable

to exacerbations of the acute attack. When very large the tonsils may meet in the middle line and so cause obstruction to swallowing and breathing.

Sometimes the enlargement of the tonsils is tuberculous in origin, and not infrequently the glands in the neck are felt to be enlarged as well.

In this condition local applications to the tonsils themselves are not of much use, and to the outside of the neck less use still. There is nothing so good for the child as fresh country air, especially the seaside or the hills in India. At the same time Prescription No. 73, 2 drachms or more, according to the age of the child, thrice daily should be given; and cod-liver oil, either pure or with malt extract or in the emulsion, as in Prescription No. 47, is very useful.

But if the enlargement is great or persists for long the tonsils should be excised, and the consultation of a surgeon for this purpose should not be delayed too long or permanent harm may result to the child's respiratory organs.

CHAPTER XIII

DISEASES OF WOMEN

MANY women on first coming to India find that they are subject to disorders from which they did not suffer in temperate climates; but care exercised during the first few months, while the woman is becoming acclimatised, will be repaid by a subsequent freedom from these minor maladies. It is a mistake to suppose that healthy Englishwomen living in India are necessarily subject to female maladies in a greater degree than their sisters in England, though irregularities in exercise, etc., are more liable to be followed by womb trouble in India than in England.

Menstruation is the term applied to a series of changes which occur at regular intervals in the uterus and which result in the outflow of menstrual fluid from its cavity. The menstrual periods normally occur every fourth week, except during pregnancy and lactation, from puberty, *i.e.*, the period at which the development of the sexual functions begins to the menopause, *i.e.*, the period at which the sexual functions cease. In Northern Europe puberty usually occurs between the ages of 13 and 16 and the menopause between 45 and 50. In Indian women it frequently begins a couple of years earlier.

The menstrual fluid comes from the uterus and consists of venous blood and of small fragments of the lining of the uterus. The discharge normally lasts from 4 to 5 days. At some date between each period an ovum or egg ripens in the ovary or egg sac, escapes from it and falls into the fallopian tube (the tube connecting the womb with the ovary) and is carried to the uterus. If the ovum meets with a male seed in the tube the two seeds may fuse and then conception is said to take place. The ovum then lodges in the uterus and develops there. If it does not meet with the male seed, it passes out of the uterus with the menstrual fluid. The process of menstruation is closely connected with the preparation of the uterine cavity for the reception of the fertilised ovum. Normally if conception takes place the periods cease.

Amenorrhœa, or cessation of menstruation or failure of the monthly periods. The periods may fail or be suspended under the following circumstances:

1. Menstruation usually is absent during pregnancy and lactation or suckling. This is in accordance with nature and no treatment is required.

If the flow occurs when a woman is suckling, it may be advisable temporarily to discontinue the suckling until the period is over, as the milk at that time is liable to upset the baby's digestion.

2. Menstruation may not appear in a girl at the usual age. This may be due to various causes, *e.g.*, backward development of the sexual organs, anæmia and general debility or it may be due to some mechanical obstruction preventing the escape of the menstrual fluid. The non-appearance of the discharge at the usual age in a healthy girl need cause no anxiety as in some cases development is late, the discharge does not begin until 16 or 17, but then is established and continues regularly.

However, should the girl be subject to periodical attacks of pain in the back and loins, irregular recurring headaches, white discharge, palpitation of the heart after slight exertion or mental agitation, or dropsical swelling of the legs, arms or face, she should be carefully treated, as these symptoms are indicative of anæmia and may be cured, and the monthly flow established regularly, if treatment is efficiently performed. Girls are especially liable to acne, characterised by the presence of 'blackheads' on the face and chest or back at the age of puberty, *i.e.*, when the monthly flow begins to be established.

Exercise in the open air, especially on horseback, but without tiring the patient; a generous but wholesome diet; cheerful society, especially of healthy girls about her own age, without undue excitement or late hours; the avoidance of close rooms, especially of ill-ventilated sleeping apartments; and cold or tepid bathing, will do much good. Change of scene with unfatiguing travel, and salt-water bathing during the intervals between the monthly periods are also often beneficial. The bowels must act regularly, if necessary with aperients; but regular action of the bowels is best achieved by means of diet (*i.e.*, by giving fruits, jams, marmalade, and brown bread or porridge) and exercise. It is better to use special abdominal exercises and massage of the abdomen

than to permit the habitual use of aperient drugs to keep the bowels acting (*see* p. 149). Aperients, together with hot foot or hip baths to which a little mustard may be added with advantage, should be taken a day or two before the expected period, if there is irregularity in the flow; and at such times cold baths should not be used, and over-exertion and excitement should be avoided. When a girl suffers from periodic pain in the back or loins unattended by the regular discharge, it is well to apply a mustard-and-linseed poultice, *vide*, p. 578, Chapter XX, over the abdomen below the navel, and on the loins at night when she goes to bed, and to make her sit, carefully wrapped up in a blanket, with her feet and legs in hot water with mustard (one tablespoonful to the gallon) for fifteen minutes before getting into bed. This treatment repeated two to three nights monthly for two or three months may establish the flow, especially when accompanied by the general treatment above mentioned. After the foot-baths and poultices special care must be exercised to prevent chills.

If these means are insufficient to establish the flow, especially if any weight or fulness is felt in the pelvis, the girl should be examined medically to determine that there is no abnormality of the pelvic organs.

3. The periods may stop for a time. It must be borne in mind that at first the monthly period usually does not appear regularly. The constitution seems to require the influence of habit, and for some time irregularity of flow may be the rule, not the exception. In the early months also slight causes may induce suppression of the periods. Damp feet, sitting on damp ground, cold bathing, fatigue, severe excitement or fright, or overwork will sometimes suddenly check the discharge, if present, or may prevent its reappearance if any of these causes occur at about the time the period is expected. Sitting on damp ground or cold bathing at or immediately after the period may be followed by an acute attack of pelvic inflammation. When the discharge is suddenly checked or prevented there is usually headache, lassitude, and probably pains in the lower part of the abdomen. Interruption of the menses may be caused by an attack of fever. The periods are especially liable to be scanty or suppressed for a couple of months after an acute attack of malarial fever. Debilitating diseases such as consumption, Bright's disease, and diabetes may cause scanty menses or complete suppression of the flow. But such stoppages are gradual and are not followed by

headaches, flushing of the face, pain in the back and loins ; while there are the symptoms of the other diseases which may be present, which will serve to point out the cause of the suppression.

Treatment. When the stoppage of the monthly flow occurs as a consequence of some debilitating disease no special treatment directed to produce the flow is desirable, but when the stoppage occurs in otherwise healthy women the treatment with hot foot or hip-baths and poultices detailed above will usually be successful. Delicate patients must be invigorated by means which improve the state of the blood (iron in some form, as Prescription No. 51 or 52) will give tone to the system. If sudden stoppage occurs after the menses have been established, a hot bath at 106° Fahr. is generally successful if taken immediately after the exposure to cold or other cause of suppression.

When the suppression of the discharge is due to acute pelvic inflammation the pain is so great as to necessitate medical attention.

4. Amenorrhœa due to mechanical obstruction.

The non-appearance of the discharge may depend on some mechanical obstruction, or disease of the womb. Obstruction chiefly occurs among young girls ; disease among older women. The means directed in the foregoing remarks having failed, after a fair trial, to produce the desired effect, a doctor should be allowed to examine the patient in order to ascertain if any anatomical obstruction or any disease exists. Such examination should on no account be delayed if the patient complains of much pain in the lower part of the abdomen, or of "persistent white discharge.

5. Stoppage of the menses due to the Menopause or "change of life" will be considered under that heading.

Caution. In any kind of delayed or suppressed discharge, medicines which excite the flow of the menses should not be used excepting under medical advice. These may prove dangerous and have often done much injury when administered by quacks or well-meaning but ignorant friends. Suspended flow may usually be overcome without such medicines, and if the individual is otherwise in good health, need not be the cause of much anxiety. If the patient is not in good health such self-drugging may be but wasting valuable time and allowing the disease which is the cause of suppression to become firmly rooted. The fear of 'decline' or other malady as the

consequence of delayed menstruation is not well founded. The delay is the effect rather than the cause of such malady.

Dysmenorrhœa, or Painful Menstruation. This is fairly common, and is generally indicative of congestion about the womb or ovaries. Or it may be due to the womb being bent backward, or it may be due to inflammation about the womb and ovaries, or to neuralgia affecting the ovaries.

The symptoms are tenderness and pain in the lower part of the abdomen, especially just above the groin; pain in the back; a feeling of weight or bearing down in the pelvis, with extension of pain into the legs, and in most cases colicky pains in the region of the womb. If the pain is very severe there may be nausea, vomiting, diarrhœa, sudden desire to pass, and pain in passing, water. Such symptoms may precede the monthly period by a few hours, or sometimes days.

The symptoms may disappear with the onset of the discharge, or they may continue with the passage of clots of blood or shreds of membranes until the discharge ceases. As a rule there is most pain when there is least discharge.

The treatment consists in maintaining the bowels moderately open, in avoiding all exposure to damp and chill for three to four days previous to the expected period, while at the same time guarding against idleness and want of occupation, which tend to constipation and a mental and nervous condition favourable to any malady. When pain occurs, a warm bath at the beginning of the attack seldom fails to give relief. After leaving the bath the patient should dry quickly and go to bed, wrapping up the abdomen in hot flannels or putting a rubber hot-water bottle on the loins and abdomen. If the bath is not available the patient may sit in a deep basin of hot water or fomentations may be applied over the loins and lower abdomen; phenacetin or acetanilide in 3 grain doses sometimes relieve the pain. Brandy, whisky, or wines should not be given: bromide of potassium, Prescription No. 55, may be given and repeated three to four-hourly. During the intervals the patient should take regular moderate exercise in the open air. Late hours and irregular meals must be avoided.

When dysmenorrhœa is persistent and does not yield to the above-mentioned remedies medical advice should be sought.

Menorrhagia: Excessive Menstruation. In the amount of the discharge, the attendant symptoms, the duration of the

period and the interval between the periods, every woman is a law unto herself. But if a woman, who has habitually had a period lasting three days at intervals of twenty-eight days, begins to have periods lasting four to six days at intervals of twenty-one to twenty-five days, such a woman is suffering from menorrhagia and should not neglect to be properly treated.

Excessive menstruation is usually due to congestion or inflammation of the womb with displacement thereof, but it may be the result of general disease, such as the early stages of heart or kidney disease, or of inflammation of the liver. Excessive menstruation is very likely to occur in women who have suffered much from over-nursing or from frequent pregnancy, and sometimes when a doubt of pregnancy exists it may be difficult to distinguish this condition from miscarriage; or it may be due to a tumour in the womb.

In all cases of profuse menstruation rest in the horizontal position is indispensable, with perfect quietness. The diet should be low, consisting of milk and light puddings, the drink being water, barley-water, or cold weak tea; wine or spirits should on no account be given. Everything should be given cold or very cool, since hot drinks may increase the discharge. Quinine must be avoided as it has an action on the womb stimulating the flow. If the liver is inactive and the bowels costive, calomel 3 grains may be given.

During the intervals the patient should sleep on a hard bed, and the clothing should be light, the sleeping-room well ventilated, bowels moderately open.

Prescriptions for Menorrhagia. (1) To regulate the flow, viz. :

A. Liquid Extract of Hamamelis	10 minims.
Ammonium Chloride	2 grains.
Peppermint water to	$\frac{1}{2}$ ounce.

Dose one tablespoonful, half ounce, to be taken three times daily during the month: this is very useful if the patient suffers from irregular and excessive periods on first living in a tropical climate.

(2) To check an excessive flow :

B. Liquid Extract of Ergot	10 minims.
Gallie Acid	5 grains.
Water to	$\frac{1}{2}$ ounce.

Dose half ounce, to be taken every four hours when the flow is profuse.

Inflammation of the Womb may be acute or chronic. It may occur in connection with disorders of menstruation, or without such prior ailment; when acute, the malady begins with cold or shivering, followed by quick pulse and fever. There is pain, increased by pressure, over the lower abdomen, the patient lying in bed with her knees slightly drawn up. There is pain about the loins and thighs, difficulty and frequency in making water (which is hot and scalds, and becomes turbid as it grows cold), a sense of weight or 'bearing down,' swelling of the abdomen, fever, nausea and vomiting. After the first few days there is usually a light-coloured discharge, which may grow yellowish-red or dark red. There may be diarrhoea with pain on passing a stool, and if the woman is subject to piles these may become congested, increasing the distress. The causes of inflammation of the womb are: cold (especially cold after confinement, or during or immediately after the monthly period), the use of too strong drugs or injections, the use of dirty pessaries, too frequent sexual intercourse, injuries or infection during childbirth.

The treatment consists of rest in bed, with linseed poultices or poppy-head fomentations applied over the lower abdomen. Unless there is diarrhoea a purgative should always be given, as hardened faeces in the lower bowels may press against the womb and mechanically irritate that organ. The diet should be light and chiefly fluid; the drink, water or barley-water. Rest in bed in the horizontal posture is essential, as walking, standing, or even sitting is very injurious and may cause a relapse. If neglected, inflammation of the womb may terminate in the formation of an abscess somewhere in the neighbourhood of the organ. This may be suspected if a recurrence of shivering with rise of temperature, as shown by the clinical thermometer, takes place during the existence of pain and tenderness as above described. If these signs supervene the help of a doctor should be sought, as an abscess in the pelvis is likely to be fraught with most serious consequences, causing either death or permanent disability.

Chronic Inflammation of Womb. This is a minor degree of the above condition. It may result from the acute form if the patient has not had a sufficiently prolonged course of treatment from the beginning of the acute stage. In chronic inflammation there is more or less pain and tenderness about

the lower part of the abdomen, with 'whites', a sense of bearing-down pain in the loins, and painful monthly periods. If long continued it may lead to structural alterations about the womb, such as enlargement and displacement. The best treatment is by means of douching with water as warm as can comfortably be borne. The patient should avoid standing about: with a little care a woman can manage many of the ordinary household tasks when sitting down as well as when standing. In very severe cases of chronic inflammation the patient should be put to bed and kept in bed lying down, with a good nurse in attendance. In the less severe cases she can get about her occupations, taking care to rest in the recumbent position as much as possible and to guard against any tendency to constipation by taking fruit, vegetables, or occasional aperients. In this, as in all womb affections, horse exercise cannot be permitted. When the symptoms are persistent medical advice should be obtained.

Womb Displacement, or Falling of the Womb. This consists most usually of a falling of the womb below and behind its natural position. The womb, which is pear-shaped, may bend forward, backward, or to either side. In such cases the body inclines in one or other of the directions mentioned and the neck remains more or less in its normal position, the result of which is that the womb gets a sharp bend at the point where the body joins the neck.

Backward displacement of the womb is most frequent in women who have been neglected during the confinement or have got up too soon after child-birth. It may occur in the first instance suddenly after exertion, as in lifting heavy weights, or it may have come on gradually from local weakness of the ligaments of the womb, or from general muscular weakness. It happens in every degree, from very slight falling to protrusion of the womb externally, or from a slight inclination from the proper position, to injurious pressure on bladder, rectum, nerves, or blood-vessels. The symptoms are feeling of weight and bearing-down pains, with a sensation of fulness in the pelvis, tenderness and aching about the groins and thighs, and frequently 'whites'. The bearing-down feeling is relieved by lying down. There is often a frequent desire to pass water, with, in some cases, inability to do so, caused by pressure on the bladder when the body of the womb is displaced backwards so that the neck of the womb presses

on the neck of the bladder. Constipation is a common symptom due to pressure of the womb on the rectum. There is usually congestion of the uterus from interference with the circulation of the blood therein. There is also frequent dyspepsia and flatulent distension of the bowels, which helps to produce the depression of spirits which is such a marked feature in these cases.

Displacement is, sometimes, associated with dysmenorrhœa, and may be complicated by 'ulceration' with a discharge from the vagina. Displacement when accompanied by ulceration is a frequent cause of sterility.

Treatment. This varies with the degree of displacement. In the mild cases measures which lessen the congestion are all that are required. A douche of Condyl's Fluid, one teaspoonful to a pint of lukewarm water, or of washing soda, one teaspoonful in a quart of lukewarm water, should be injected into the vagina once daily. The patient should lie on her side, or face downwards, and should assume the knee-chest position for ten minutes two or three times daily. By means of this position the uterus falls back into its normal place and the congestion is lessened. To get into the knee-chest position the patient gets on her knees on the floor and then bends forwards till the chest rests on the floor; she keeps in this position for a few minutes at first, gradually increasing until she can remain in it for ten to fifteen minutes.

If the displacement is considerable it may require replacement at the hands of a gynecologist. When displacement has occurred it is likely to return, and instruments called pessaries may be necessary to hold it up. If these fail it may be necessary to fix the womb in position by means of sutures. Pessaries may be the cause of ulceration, and need to be removed for cleaning at regular intervals.

Womb Ulceration. This is a sore at the mouth of the womb, which may be slight or severe, innocent or malignant. It arises from injury from ill-fitting or dirty pessaries, or from chronic inflammation and displacement of the womb. The symptoms are white discharge, sometimes unpleasant smelling, chronic backache, and increased loss of blood at the monthly periods. It cannot be positively stated that ulceration exists without examination, and when so found it requires careful medical treatment until it is healed. If a woman notices that there is a blood discharge after sexual connection it probably indicates ulceration which may be

malignant, and she should seek medical advice without delay.

Whites (Leucorrhœa). This means an increased secretion from the vagina. The discharge may be white like the white of an egg, or yellowish, and may be slight or amount to several ounces daily. The causes are anæmia, chronic inflammation or displacement of the womb, congestion due to excessive sexual intercourse, frequent child-bearing, and tumours in the womb or its neighbourhood, and ulceration of the mouth of the womb.

The treatment consists in careful attention to any womb affection which may be present. If there is no obvious cause the general health is attended to, bowels are kept regular, proper exercise is taken, and the patient should be as much as possible in the open air. To arrest the discharge alum lotion one teaspoonful to the pint, or bicarbonate of soda in the same strength, may be used. In children a white discharge may be due to thread-worms, which, escaping from the rectum find their way into and irritate the vagina. In such a case the treatment would be to get rid of the worms with *santonin* powders or *quassia* injection and to keep the parts scrupulously clean.

Change of Life (Menopause). The monthly discharge in women begins about the fourteenth and ends about the forty-eighth year. It is to the period of cessation that the term 'change of life,' or menopause, has been applied. This period is popularly supposed to be fraught with danger to women, and there is often considerable suffering at the time, and in some women a more than ordinary liability to various ailments. The majority of women pass through this time without any great derangement of health, the monthly flow becoming more scanty until it ceases altogether. The most common symptoms associated with the menopause are flushing of the face, giddiness, sweating, throbbing of the blood-vessels in the head, headaches, nervousness, despondency, irritability of temper, palpitation of the heart, and gradual cessation of the monthly flow. Less common but well-known symptoms are digestive troubles, such as nausea, constipation, and bad taste in the mouth; pain in the neck, and numbness and tingling of hands and feet. The woman becomes less active and usually puts on flesh. Sometimes the monthly flow ceases for two, three, four or even six months, and then reappears somewhat more profusely than normal, to cease

again either temporarily or permanently. There should be no irregular frequently recurring discharge of blood at the menopause, and the periods should not be more profuse than normal at this time. If there is any marked increase in the monthly flow at this time the woman should not hesitate to be examined carefully. Cancer of the womb frequently occurs at the change of life, and makes much headway before examination, because the woman considers the profuse, and possibly irregular, discharge of blood which troubles her incidental to this change. If every woman, who suffered from excessive and irregular monthly discharge from the age of thirty-seven years and upwards, were examined early by a skilled doctor, the mortality of women from cancer would be quickly diminished. At present the cure of cancer is only possible in the early stages of the disease; and if the woman neglects for some months an irregular blood discharge she may find, too late, that a cancerous growth was the cause of the trouble. *There is no pain* in the early stage of the disease and therefore no woman because she has no pain should neglect to be examined thoroughly by an expert gynaecologist if she has an irregular bloody discharge.

While irregular and profuse menstrual discharge sometimes occurs in healthy women at the change of life, such discharge should never occur after the change; consequently a woman should immediately be examined if she begins to suffer with any sort of discharge from the womb after the change of life has been established, as only too frequently cancer is the cause of this discharge.

While emphasising the importance of attending to such irregular hæmorrhages, we would not wish it to be thought that cancer is the only cause of such irregularity at the menopause, but it is only after thorough examination by a competent physician that a correct diagnosis can be established, and therefore we would advise every woman suffering from such irregularity to lose no time in submitting to a thorough examination.

Treatment. The bowels must be kept freely open; sweating should be promoted, as women who perspire freely have less trouble than others during this period of change; the woman should be careful not to over-exert herself, but at the same time she should not allow herself to sink into a condition of semi-invalidism; she should also try to occupy her mind with outside interests. Further, she should remember that

the inconveniences and discomforts from which she is suffering are but a temporary phase, and if she lives a careful and well-regulated life during the time she will have many healthy and comfortable years afterwards.

For the headaches, flushing and giddiness, the best remedy is Calcium. Calcium Lactate or Hypophosphite in 5 grain doses may be taken in water three times daily.

Sore Nipples. Cracks about the nipples, occurring during suckling, not only give rise to great pain but may also cause inflammation and abscess of the breast. All nipples are liable to crack if not washed and dried after nursing, but the dark-coloured nipple is less liable to become sore than the pink one. The nipple should never be left in the child's mouth after the process of suckling is finished, as that makes the nipple sodden and more liable to crack. It should be remembered that sore nipples may arise from "thrush" in the child's mouth, which must be cleaned as well as the mother's nipple.

When nipples are simply tender but not cracked, hazeline ointment is the best application, and care should be taken that the dress does not press upon the tender part. The nipples should be covered by a nipple-shield when the child is suckling. After suckling the nipple should be bathed with equal parts of brandy or eau-de-Cologne and water: or alum-water may be used, and a little hazeline ointment should be afterwards applied.

When cracks exist, if small they should be covered over with Friar's Balsam or flexible collodion to seal them up. If there is a deep crack or fissure it should be washed with alum-water before and after suckling, and the nipple should in all cases be protected by a well-fitting nipple-shield through which the child sucks. If the crack is very large, suckling from that breast should be suspended for a short time to enable the crack to heal, as the child may get indigestion from the blood which comes from the crack, and the mother may get a breast-abscess if she persists in nursing the child.

Breast Inflammation. This occurs most frequently in nursing women but may be present in others, especially in pregnant women. It may arise from injury or from suckling a child when the nipples are cracked and sore.

If the child dies or is weaned too suddenly, the breasts become engorged but not inflamed if the treatment noted below

be followed. When inflammation occurs towards the end of suckling it is the result of over-suckling and weakness.

Inflammation of the breast is most common after a first confinement, as the nipples are then most tender and liable to crack with suckling. Inflammation of the breast is accompanied by sharp shooting pain, fever, possibly with shiverings, hardness of the breast, and, later, heat and redness of some part of the breast is observed ; there is generally considerable swelling of and great pain in the breast from the beginning of the inflammation. The secretion of milk may be stopped, but this does not always occur if the inflammation is partial. The pain and tenderness are increased by moving the arm.

Treatment (I) of Engorged Breasts. As above stated, if the child dies or is weaned too suddenly the breasts become engorged and painful, and there may be fever. In such a case the treatment of the breasts is : (1) Allow no one to touch the breast. (2) Restrict the amount of fluid very considerably ; the less fluid the patient drinks for two or three days the more rapidly the engorgement will disappear. (3) Give the woman a large dose of Epsom salt daily to move the bowels very freely. (4) If the patient is in such severe pain that she cannot sleep, a Dover's powder, $7\frac{1}{2}$ grains, may be given at night. If this regimen be carefully followed the woman will be perfectly well in four to five days. If, however, the breast-pump is used and belladonna plasters or other drugs be applied to the breasts the patient may get a breast-abscess, which may take a long time to heal.

(II) Of Inflamed Breasts. If the woman has a sore nipple, paint it with Friar's Balsam after each nursing. It may be necessary to use the nipple-shield if nursing is very painful. If one or both breasts become tense and painful apply hot boracic fomentations after each nursing. If one part of a breast becomes hard and swollen and begins to throb consult a doctor at once if possible as an abscess may be forming. It will be necessary to stop the nursing in that breast until the inflammation has subsided.

(N.B.—The difference between engorged and inflamed breast is this : the engorged breast is uniformly enlarged and hard, but not red ; the inflamed breast is hard and tender in one spot, which may be in any part of the breast, but is often above the nipple.)

If the inflammation is subsiding the pain and tenderness

leaves the breast and the hard patch rapidly becomes smaller. If, however, the inflammation does not subside, 'matter' forms in the breast, constituting abscess of the breast. After feelings of feverishness and shooting pains the breast enlarges at one particular spot, with throbbing pain; the skin becomes red and shiny. If not incised with a lancet this spot becomes very prominent and pointed and finally bursts, permitting pus or matter to escape. As soon as this "pointing" is perceived the abscess should be incised by a doctor and the pus let out. An early incision of a breast abscess will save much suffering.

As breast-abscess is painful and exhausting, the patient must be put on to a generous diet and some tonic, such as Fellow's syrup, one teaspoonful in water thrice daily after meals; or Prescription No. 52 three times daily after meals should be given.

Breast Pain. The breasts are likely to become enlarged and tender just before the monthly periods. This pain lasts a few days, but gives no great trouble if the breast has not at some time been actually inflamed. In women reaching the change of life the breasts may become enlarged and painful and the woman may feel a tender lump in some part of the breast. If there is any suspicion of a lump the patient should submit to a careful medical examination, as cancer of the breast is common in women.

Pain in the breast may be troublesome in girls about the period of the establishment of monthly courses, and occasionally in boys about the age of puberty. The pain may be due to neuralgia, and in this case it comes on periodically, at regular intervals of twelve to twenty-four hours. In women living in the tropics severe pain in the breast, apart from inflammation or tumour, is sometimes cured by regular dosing with quinine, e.g., Prescription No. 52 three times daily.

Breast Cancer. Cancer in the breast generally occurs in women past middle life. It frequently begins as a small, hard usually painless swelling in the breast substance which gradually increases in size. Any woman who discovers such a lump in her breast should at once consult a doctor. Women at the change of life often imagine that the tenderness which is likely to occur in the breast at this time is due to cancer and in order to put their minds at rest they should have a careful examination as soon as possible. If the case is one of cancer the earlier the removal is affected,

the better are the chances of recovery ; if it is not cancer, the sooner the woman is reassured on that point the better it will be for her nervous system.

Breast: Other Diseases. Other diseases which develop as tumours in the breast are principally :

(1) *Adenoma or fibroma*, generally met with in women between the ages of twenty and thirty. The growth begins as a hard nodule. When small it is freely movable. The veins under the skin become enlarged, but there is little or no pain. The skin is movable over the tumour and rarely ulcerates.

(2) *Cysts*. Cysts are composed of a bag containing fluid. They are most common in women between twenty to forty years of age. A cyst begins as a small round, hard lump, which may attain a large size, affording to the fingers the sensation of a fluid moving from side to side. All such maladies require surgical operation.

Pruritus. Irritation of the private parts often takes the shape of intense itching or smarting, which prevents sleep and so destroys the health. It may depend on personal uncleanliness, or be associated with bladder or bowel disturbance, or with diseases such as diabetes, in which an unusually large amount of urine is passed, so increasing the moisture of the parts, or with eczema extending from the groins to the private parts ; or lice infesting the hairs about the parts may cause it ; or it may result from irritation of the discharges in cancer of the womb, or in 'whites' ; it often occurs in pregnancy as a result of the congestion of the private parts. Finally, it may be due to an abnormal condition of the nerves ending in the skin. The itching skin may show no abnormality, or there may be an eruption of minute watery vesicles. The treatment must depend on the cause. If it be due to 'irritable bladder,' copious draughts of water or barley-water, with avoidance of all spices and made-up dishes and wines, spirit or beer, will soon relieve the irritability. If due to bowel trouble, thread-worms (*q.v.*) may be the cause, or diarrhoea or constipation may set up an irritation. As a local application for the intense itching, cold or iced water or carbolic lotion half ounce in 1 pint of water may be used. If the irritation is accompanied by the eruption of vesicles, calamine lotion or alum lotion may be used. Bran baths, or baths of borax or washing soda 2 ounces in twenty-five to thirty gallons of hot water, are sometimes very beneficial.

If the itching is due to lice the hair should be shaved off the parts, and mercury ointment or white precipitate ointment be applied. A thorough application of soap and water should always be used before other remedies are tried. If the itching is due to eczema the parts should be freely anointed with olive oil or vaseline after cleansing with bran and water—in this condition soap should be avoided. Pruritus is nearly always worse at night than at other times.

CHAPTER XIV

PREGNANCY AND LABOUR

Pregnancy. The pregnant condition lasts from 273 to 280 days, or about 40 weeks.

Estimation of the Date of Delivery. The date of delivery can be told fairly accurately by various methods, none of them, unfortunately, being very exact. If the menstrual history is correct (it is a good plan for every married woman to note down each month in her diary the date of the first and last day of her period) we can tell approximately the date of delivery by counting forward 10 lunar months or 280 days from the last day of the last menstruation. The easiest method of doing this is to add on 9 calendar months and three days. Thus if menstruation which began on July 1st ended on July 5th then 9 months and 3 days added on brings the date of labour to April 8th. There is no certain method of ascertaining beforehand the exact date of delivery but the above method is the centre of a fortnight during which delivery will probably occur.

Signs of Pregnancy. (1) Cessation of the monthly flow—which, however, in exceptional cases may not occur. (2) Morning sickness: this usually begins six weeks after conception, but may be a little earlier; it usually lasts six weeks. (3) Enlargement of the breasts, generally after the first month, occasionally not till the third month. (4) Enlargement of the coloured ring of tissue which surrounds the nipple; this occurs in the third month, and at the same time the nipples and breasts may become tender; about the fifth month there may be oozing of fluid from the breast, in a first pregnancy this is clear and yellowish, in subsequent pregnancies it may be milky. (5) Enlargement of the abdomen: this does not take place till after the third month. (6) Quickening or movements of the child: these begin between four and a half to five months, and are sometimes accompanied at first by faint feelings. (7) Pulsation of the child's heart: this resembles the ticking of a watch under a pillow, can be heard from four and a half months onward, and is audible on putting the

ear on the abdomen either in the midline below the navel, or in a line joining the hip-bone with the navel on the left side. (8) Movement of the child, which may be felt externally after the sixth month on placing the hands on the abdomen. (9) Variations in temper, disposition and appetite, the woman becoming capricious and showing desires for special and sometimes unusual articles of diet.

Treatment of Pregnancy. Pregnancy is a physiological state, and therefore the woman should continue to live a regular and healthy life. She should take exercise daily. some women playing tennis regularly for the first four months ; this need not be discontinued if the woman is healthy and is accustomed to playing ; horse riding should not be carried on as a rule. Walking exercise is the form which may be indulged in until the end of pregnancy, and if the woman is in a hilly district, walking up and down the hills will strengthen the abdominal muscles and render labour easier. The woman should keep regular hours, should avoid hot and stuffy rooms, late nights and dancing. The diet should be varied but simple and should not be in excess of the normal habit—there is more danger of eating too much than too little. Cravings for unusual articles of food should not be indulged. It is well to refrain from eating between meals. Indigestible food, spices, pastry, excess of meat, fried foods, &c., should be avoided. Water should be taken freely between meals, alcohol is best avoided and tea, coffee and aerated waters should not be taken in excess. Plenty of fresh fruit and vegetables are essential. If the pregnant woman is exposed to sudden strains or to shaking, the womb may be excited to premature action and miscarriage is liable to occur. As the danger of any disease is increased if it occurs during pregnancy, any unhealthy pursuit should be discontinued. It is especially deleterious for a pregnant woman to sleep in a badly ventilated room, for as the child grows there is a great need for pure air. The clothing should be warm but easy. Stays may be enlarged by a gore of elastic on each side, or special maternity corsets may be worn. The breasts should have plenty of room ; and from the end of the sixth month onward the nipples should be bathed daily with salt and water, or eau-de-Cologne and water or whisky and water, and should be exposed to the air, if the weather is not too cold, for about one hour daily. If the nipples are depressed they should be pinched and drawn up between the fingers regularly every day. In healthy pregnancies no medicine

is needed, except possibly to overcome constipation: this is best done by taking cascara pills. Castor oil should be avoided, as it tends to constipate afterwards; powerful purgatives and patent purgative pills should also be avoided, as these are deleterious in pregnancy.

Antenatal Care. It is most important that every pregnant woman should be examined by a competent doctor at least once during the pregnancy, in order to determine that there is likely to be a normal confinement and that all is going on well with the prospective mother and child.

Preparations previous to Labour. Bathrooms, water-closets, and drains should be well cleansed. Proper disposal of refuse should be insisted upon. The best-ventilated room obtainable should be selected for the lying-in period, and it should not be kept too warm either before or after labour, as is generally the case in the cold season of northerly districts. The antecedents of the nurse should be inquired into. If within four weeks previous to the woman's confinement the nurse has been engaged with a scarlet fever or a blood-poisoning case, or with a woman suffering from puerperal fever, she should not be employed. If she has been attending any other diseases or burns or scalds, she should have a full bath and wash her hair with carbolic soap and wear a fresh dress. Arrangements should be made for a good supply of pure absorbent cotton-wool, to be used as sponges during labour. If practicable, artificial aseptic sanitary towels and sponges should be obtained. All these things, if used, should be burnt after the labour. Plenty of ordinary napkins should be boiled previously, then dried, well aired, and put ready to hand. Arrangements must be made for an ample supply of both hot and cold water. If it is a first labour, and therefore likely to be long, light nourishing food should be prepared—*e.g.*, egg-and-milk, lightly boiled egg with toast, hot milk, or beef tea or other soup—and a feeding-cup should be obtained. A chamber utensil to receive the after-birth and a bed-pan and an enema syringe should be in readiness. Other things which should be ready beforehand are: a large square of flannel called the receiver or an old blanket or shawl for the child to be placed in at its birth; a waterproof sheet, or, failing this, a large piece of new American cloth to prevent the mattress from being soiled by the discharges; the bandage for the child; the child's clothing; large and small safety-pins; three or four ligatures to tie the navel-string, as below; blunt-pointed

scissors to cut the string; soft linen for dressing the navel; some pieces of fine soft linen to wipe the baby's eyes, nose, and mouth at birth—these should be placed in boric-acid lotion; sweet oil to remove the cheesy material covering the baby; Wright's Coal-tar or Vinolia bath soap and a fine sponge for washing the child; 'Blue-seal' vaseline in a wide mouthed bottle.

The binder for the infant should be of thin flannel, about 5 inches broad and 36 inches long, *i.e.*, long enough to go twice round the body.

The ligatures for the navel string should consist of silk or sewing-thread, as cotton is not strong enough and tape may slip. Each ligature should be composed of ten threads loosely rolled into a cord and tied in a knot at both ends, so that they may lie evenly. These ligatures ready sterilised can be purchased from any good chemist.

Labour. This is the common term for a confinement. If the birth takes place before three months it is called an abortion, before six months a miscarriage, and between six and nine months premature labour.

The signs of approaching labour are: a sinking downward and forward of the abdomen, a feeling of physical well-being, frequent desire to make water, perhaps griping and a sensation of squeezing, and a mucous discharge sometimes stained with blood and known as 'the show': all or any of these signs may occur some hours, or even a day or two, before actual labour pains begin. With the symptoms of approaching labour the patient's bed should be prepared. A hard coir or horse-hair mattress is preferable. Over this is the usual blanket and sheet, over which should be placed a long sheet of India rubber or American cloth, which should be fixed to the bed at the four corners with safety-pins; then on this 'guard' a blanket folded four times, then a sheet doubled in a similar manner, which is called the "draw-sheet". All this is to absorb the discharges and to prevent the mattress on which the woman has to lie afterwards becoming soiled. After labour is over and the mackintosh-sheet and extra blanket and sheet are removed, the bed should be quite dry. A strong towel should be attached to the head of the bed for the purpose indicated, later. The woman's dress should consist of a night-dress petticoat, and dressing-gown. As labour progresses the night-dress is rolled up above the waist so that it may not be soiled, and the petticoat and dressing-gown are removed; she is

then covered with a loose sheet, which is taken away later with the 'guard' and draw-sheet. If the bowels have not acted freely within six hours an enema of soap and water should be administered. (*N.B.*—Carbolic soap should never be used for enemata.) Emptying the bowels removes the mechanical obstruction to the progress of the baby's head offered by a hard mass of fæces in the bowel, ensures cleanliness, and prevents discomfort; for the contents of the lower bowel, if this be full, are forced into the bed towards the end of labour.

The beginning of labour is denoted by pains in the back and abdomen below the navel: these pains recur at regular intervals and gradually increase in strength. At first the pains resemble cramp and worry the woman a great deal; when these pains have lasted for some hours the waters generally break, and the woman then gets bearing-down pains, during which she shuts her mouth and bears down as if she were trying to relieve the bowels of a constipated stool. There may be slight shivering and vomiting during the first pains. The patient should be encouraged to walk about or to sit up, until the waters break as this accelerates labour; she should relieve the bladder and bowels from time to time, and may sit in a bath of hot water before the waters break. The hot water relieves the first stage pains. After the waters break the pains recur every seven to ten minutes and get stronger. The patient should now take to her bed and lie on her back with the knees drawn up. When the bearing-down pains occur the patient should hold her breath, place her feet flat on the bed, and pull hard on the towel attached to the head of the bed. This assists the expulsive efforts of the uterine and abdominal muscles. The time of labour varies from four to twenty-four hours, being generally longest in those having a first child. In ninety-five out of every hundred cases the head of the child first emerges, the rest of the body soon following.

The main points to care for during a normal labour are:

Firstly. To support the perineum, *i.e.*, that part of the mother's body between the back wall of the vagina and the opening of the bowel, the anus; this part is exposed to great pressure as the head passes, and is liable to be torn as there are no bones in the neighbourhood to take the pressure. Laceration of the perineum is most likely to occur in a first labour, and its occurrence is almost sure to follow a very rapid delivery. To prevent laceration of the perineum (*a*) the parts should be bathed frequently during labour with hot water to which lysol

or saponified cresol has been added, as the soap in these two preparations acts as a lubricant and renders the passage of the head easier. (b) The head may be delivered in the intervals between two pains by pressing on it from behind the anus. (c) If the head is coming down very quickly the patient should be told to cry out, not to bear down with the pain, and the progress of the head should be retarded by pressure of the fingers on the visible part of the head.

Secondly. To free the child's eyes and mouth from discharge or mucus.

Thirdly. To see that the womb contracts as soon as the child is born. To secure this, when the head is born the hand of an attendant should be placed over the womb, making moderate pressure, which should be maintained until the after-birth comes away. After the birth of the child the womb shrinks down until it lies below the navel, where it can be felt as a hard mass. If it cannot be thus felt, bleeding into it is probably occurring.

Fourthly. To divide the navel-string (*see after*).

During the labour thirst may be relieved by cold water, cold tea, milk-and-water, or iced milk; the patient should be allowed to eat light nutritious food if she cares to do so. Sleep during the intervals between the pains is refreshing and restorative; the face and hands may be sponged and the hair brushed if the patient expresses a wish for it.

In from ten to twenty minutes after the birth of the child the after-birth comes away. Sometimes this does not leave the womb for thirty to forty-five minutes after the delivery of the child; in no case must the cord be pulled on to hasten its progress. The delivery of the after-birth (placenta) is attended by a renewal of the pains, and usually by a slight discharge of clotted blood. In other cases a more fluid, bloody discharge occurs, which is of no consequence if of a few ounces, but which if profuse amounts to hæmorrhage (*see below*). In some cases the after-birth presents at the orifice, and may be expelled by pressing on the womb through the abdominal wall.

One teaspoonful of liquid extract of ergot should be given after the delivery of the after-birth, as this helps the uterus to contract and so checks bleeding.

The above refers to straightforward labour, but sometimes labour is preceded a few days or even one to two weeks by 'false pains': such pains are felt in the abdomen, not in

the back: they are very irregular in force and frequency, one pain being strong and the next weak, one following another in ten minutes and a third occurring in twenty to thirty minutes, and are not accompanied by a show. False pains are usually caused by intestinal irritation, and are generally removed by a dose of castor oil.

Treatment after Labour. When the after-birth has been delivered the patient should be washed, the soiled sheets, &c., should be removed, a clean thick dry pad should be put on, the nightdress drawn down, and the patient should be allowed to sleep. She should be kept on her back for the first two hours, or longer if there be any bleeding.

After the birth of the child, if the mother is much exhausted, a cup of hot milk or an egg beaten up in milk is the best stimulant. After the woman has well rested and perhaps slept for a short time, the private parts should again be washed and another dry napkin put on. The discharge is usually rather free at first, but if the womb can be felt hard and firm through the abdominal wall there is usually no reason for uneasiness. If, however, the womb is felt soft and boggy, bleeding after delivery is going on and needs appropriate remedies. The washing of the private parts and the application of a clean napkin is necessary four to five times daily for the first three days. It is a matter of convenience to the attendant and renders the required cleanliness easier if the hair on the private parts is shaved off before the labour begins. Excitement from visitors must be avoided. None but the husband and the necessary attendant should be admitted for the first five days, and special care must be taken to exclude from the lying-in room any one who has recently been in contact with any sort of infectious disease, as lying-in women are peculiarly liable to these diseases. The room must be kept well ventilated, but care must be taken that neither the mother nor the baby are exposed to cold.

The patient should pass urine within six hours after delivery and this should be done on the bed-pan. If this cannot be used the patient may turn on hands and knees. If there still be difficulty the lower part of the abdomen and the private parts should be fomented with hot water. Owing to the distensible state of the bladder, the patient will often remain for very many hours before making water, and this may lead to inflammation or paralysis of the bladder.

The state of the bowels after delivery is of importance, as

constipation sometimes causes fever during the lying-in period. On the morning of the third day after delivery, if the bowels have not been opened, a tablespoonful of castor oil should be given. If there is reason to suspect an accumulation in the lower bowel, as often occurs during the later days of pregnancy, and is known by passage of hard round lumps, an enema of soapy water should be given. If the patient does not suckle her child, purgatives will be the more necessary for the relief of the breasts. In this case saline aperients, Prescription No. 54, or citrate of magnesia will be found most useful.

Until the bowels have acted the diet should be light but nutritious, *e.g.*, custards, boiled fish, lightly boiled, poached or scrambled eggs once daily, milk, jellies, or junkets and soup; tea and toast may also be given. After the bowels have been moved the patient may have chicken, mutton or fresh game. Vegetables such as onions, cauliflower, spinach, and vegetable marrow may be given, but potatoes and rice should be avoided as the starch in these is likely to cause flatulent distension of the bowels. If there is a decided disinclination for food there is probably something amiss.

Attention must also be directed to the discharge called the lochia, popularly 'the cleansings'. The passage of this is accompanied by more or less after-pains, generally first felt about half an hour after delivery. During the after-pain which is simply a contraction of the uterus similar to that which occurred during the course of labour, the discharge increases and blood-clots may be expelled, especially when the patient rises in bed to make water. After-pains are salutary, as they diminish the size of the womb and expel its contents, *i.e.*, blood and small clots. The application of the child to the breast often brings on or aggravates the after-pains. Unless very severe no medicine is needed, but if really troublesome, aspirin powders (10 grains) should be administered every three hours until the pains cease to be troublesome. At first the discharge is bright red blood with possibly a few small clots: on the sixth day it becomes thin and watery and yellowish in colour, at last appearing like soiled water. It has a peculiar odour resembling that of the ordinary menstrual discharge. The quantity and duration vary considerably. In some patients it ceases with the after-pains a few days after delivery, but generally begins again when the patient exerts herself. Its continuance is a sign that the womb is not contracting properly. As long as it continues the parts should be frequently washed

and the napkins changed. As this secretion is necessary its sudden interruption is generally a sign of ill-omen, such as puerperal fever, and the patient should be carefully watched.

In ordinary cases the breasts remain quiescent during the first thirty-six hours after the delivery; they then begin to enlarge, with slight pain, their substance becoming heavier and more tense. This depends on the activity of the breast-cells in secreting milk—this activity being preceded by an increased flow of blood to the breasts. There is no shivering or feverishness if the woman is progressing normally. If shivering and fever should occur the woman ought to be given a saline purgative (Prescription No. 54) and an enema to clear the bowels out quickly. If the breasts are very tense they may be fomented and gently massaged towards the nipple. If there is hæmorrhage after the delivery of the after-birth the child should immediately be put to the breast, as suckling promotes firm contraction of the uterus. If there is no hæmorrhage the babe should not be put to the breast until five to six hours after the delivery. The child should be nursed three times during the first twenty-four hours, every four hours during the second twenty-four hours, and every three hours, with at most only one feed at night, from the third day onward. Applying the child to the breast at these intervals stimulates them to secrete, and the first watery milk, contains a mild purgative called colostrum, which helps to rid the babe's bowels of their contents. On the third day the milk is opaque, white, and has a sweet taste. If the breasts do not secrete properly the patient should be given barley-water and milk to drink. The child should not be applied to the breast more often than indicated above, as frequent fruitless suckling renders the nipple hot, tender, and irritable. If the nipples are short and badly formed a nipple-shield consisting of glass with a rubber teat is used, and care is taken to fill the glass part with milk by gently massaging the breast, before applying the baby to the shield, as if the child has difficulty in drawing up the milk through the shield it quickly becomes tired and will not make the necessary efforts to suck. Each time the child is about to suck the nipple should be cleaned with soft old linen and plain boiled water, and again when the child ceases suckling. The infant's mouth should be treated in like manner.

Scrupulous cleanliness is desirable, as even a little milk drying about the nipple may turn sour and irritate it, or it

may be received into and disorder the infant's stomach. The nipples and breasts should be washed with warm water and soap night and morning. By such care the chance of sore nipple and bad breasts will be avoided. During the first three days the mother should suckle while lying down. She can turn on one side or other and, supporting herself on her elbow, let the nipple fall into the child's mouth. Afterwards the semi-erect posture should be taken, from which the infant sucks more easily. Both breasts should be used alternately. The mother should remain recumbent for the first three days, during which, if there has been no tear of the perineum, she may exercise the perineal muscles at frequent intervals; this is done by drawing the body up as if an attempt were being made to prevent the bowels from acting. After the first three days, if there has been no perineal tear she should begin exercises to strengthen the muscles of the abdominal wall. These exercises are done as follows: Lying on her back, the pillows having been temporarily removed from under the head, the woman crosses her arms on her chest and straightens out the legs. She then raises herself into a sitting posture, the attendant holding the legs below the knees to ensure that they are not lifted from the bed; from the sitting position the patient then lays herself down slowly. This should be done at first twice in the evening. Later, as it is done more easily, the patient may do it four to six times thrice daily. When this exercise is freely done the following should also be adopted: The patient, again lying flat on her back, draws up the knees until the soles of the feet rest on the bed; the thighs are then straightened until they are at right angles to the abdomen, and the knees being kept rigidly straight, the legs are laid slowly down on the bed: this exercise is harder than the foregoing one, and should not be begun until that is easily accomplished. These exercises increase the blood discharge at first, but they are very beneficial in restoring tone to the abdominal muscles, to the intestines, and to the uterus and its ligaments; they should not be done if the patient is suffering from fever. If the patient attempts to do the exercises too often at first she will suffer from pain in the abdominal muscles, but this is not serious. The patient, if she has had a normal confinement, may be allowed to sit upon a chair on the eighth day and to begin to move about her room on the tenth day. A great part of her time should be spent in a semi-recumbent position

for the first month, but it is not desirable for a healthy woman to spend too long in bed.

When the mother resumes her dress, if she wears corsets these should be so arranged as not to press on but to support the breasts. She must remember that her milk is affected by any indiscretion in food or habits, and that unless her health be maintained her infant will certainly suffer. Fretting and irritability react very unfavourably on the milk, and therefore the woman should strive to maintain a calm and equable disposition. The diet should be nutritious and varied, and there is no objection to the patient eating anything which did not upset her digestion before the birth of the child. Fresh fruits and vegetables are especially desirable, and there is no valid reason why potatoes and peas should be debarred when the woman is able to move about. They tend to cause flatulence while the woman is lying-in, so may be avoided at that time. Barley-water is useful in increasing the quantity of milk. Drugs such as castor oil, rhubarb, mercury, arsenic, and opium affect the child when taken by the mother.

The foregoing relates to natural and straightforward confinements, but other circumstances may arise, which are now briefly noticed.

1. **THE LABOUR MAY BE TEDIOUS AND LONG.** This occurs in weakly women, the pains being feeble, or ceasing usually after the 'waters' break. If four hours elapse without pains, assistance should be sought. In the meantime nourishing soup and chloral (Prescription No. 29) should be given, and after rest and sleep the pains may probably return.

2. **CORD ROUND THE NECK OCCURS ONCE IN ABOUT TWELVE CASES.** Frequently it is not of much consequence, as when the cord is round the child's neck it is usually long. It should be loosened by gentle traction, and the shoulders should be allowed to slip through the loop. Or, if the cord is long, it may be slipped over the child's head. In some cases it has been necessary to cut the cord through, to prevent the child being strangled. When so necessary, the cord should be cut through, and tied immediately, else it will bleed profusely.

3. **PRESENTATION OF THE BREECH.** This occurs once in about sixty cases, and the labour is tedious, because the infant, being doubled at the haunches, requires a larger space. As a rule no interference is required until the breech and feet are born, when the case becomes converted into presentation of the feet (*see* No. 5).

4. **TWIN BIRTHS.** This occurs once in about seventy cases. The presentation generally varies, the first being the head and the second a foot case, or the reverse. After the birth of the first child, the presence of a second is known by the slight reduction in size of the womb. Sometimes the 'after-birth' of the first child comes away before the birth of the second, sometimes not till afterwards, and attempts should not be made to remove it, as there may be only one 'after-birth' for both infants. After the birth of the first, the womb should be stimulated to contract by keeping up a grasping movement of the fingers

and thumb on the lower part of the abdomen. Sometimes the birth of the second child follows that of the first in ten minutes, but on other occasions not for some hours. Under such circumstances the woman should rest until pains return, and she may drink a little cool tea or arrowroot, the precaution being taken to examine the pulse frequently lest bleeding may be going on unsuspectedly. If bleeding is occurring the pulse becomes quick and feeble. The second labour is usually quicker than the first, the soft parts having been already dilated. After the birth of the second child and the passage of the 'after-birth' especial attention must be paid to the contraction of the womb. The womb should be pressed with the hand until it can be grasped as a firm hard ball.

5. PRESENTATION OF THE FEET. One or both feet may come first, which happens once in about 100 cases. The birth is generally safe for the mother but not for the child, which is apt to suffer from the circulation of the cord being obstructed by pressure. Footling cases should not be hastened in the early stage, as the longer the buttocks are detained the greater will be the dilatation of the parts, and the birth of the head will be more easy. When the breech is expelled, the cord should be examined, and, if the pulsation of the cord has ceased, the birth of the shoulders should be hastened by pressing the body steadily downward by pressure on the womb through the abdomen; on no account should the body be pulled upon until the shoulders have been born, as such pulling is likely to give rise to great difficulty. The toes of the infant turned to the back of the mother is the most favourable position for the birth of the head. If circulation is restored in the cord after the birth of the shoulders there is little cause for anxiety for the safety of the child, but if there is no pulsation in the cord it is necessary to assist at every pain, and hasten the delivery of the head by pushing on the uterus through the abdomen. The head being born, the assistant should examine the cord, and if it pulsates, the child should not be separated for a few minutes until it begins to cry. If there is no circulation in the cord the infant should be treated as detailed for still birth (p. 477).

6. PRESENTATION OF THE FACE. Instead of the top of the head, the face may present, which happens once in about 230 cases. When it occurs the labour is protracted. The child is seldom in danger but the head and face are swollen and disfigured, and, unless the mother is prepared, the appearance may give a severe shock. In the absence of medical aid it will be best to wait patiently for the natural termination.

7. PRESENTATION OF THE HANDS, OR 'CROSS-BIRTH'. Presentation of the hand, or the elbow or shoulder, occurs once in about 230 instances. The assistance of a doctor is urgently required, as the operation of turning the child will be necessary.

8. BLEEDING, OR HÆMORRHAGE. Bleeding may occur either before or after the birth, but does not happen to an alarming extent more than once in about 300 cases. Bleeding occurring before the birth generally depends on the 'after-birth' being seated over the mouth of the womb, so that, as the latter dilates, the vessels of the 'after-birth' are torn. This kind of bleeding may occur at any time after the sixth month of pregnancy, but is more frequent between the eighth and ninth months. In every case of bleeding during pregnancy absolute rest is necessary.

and medical aid should be sought without delay, as the patient's condition may be very serious.

Bleeding after delivery may happen immediately before or after the expulsion of the 'after-birth, or it may come on some hours, or even days, after the confinement. When bleeding occurs immediately after delivery it depends on feeble contraction of the womb. When the 'after-birth' separates, loss of blood to some extent is the natural consequence; nor is the woman injured by a moderate loss, such as 8 to 10 ounces. But if the quantity greatly exceeds such an amount it produces fainting, the woman being pale, cold, and gasping for breath. The womb will be found soft, and to induce it to contract firm pressure should be made over the lower part of the abdomen, and if possible the womb should be firmly grasped in the hand through the skin. Iced or cold water should be given to drink, and the child should be put to the breast. No stimulants should be given, and the person should not be raised into the upright posture, which might bring on fatal fainting. Liquid extract of ergot may be given in drachm doses every hour for the three hours.

When bleeding occurs some hours or days after delivery it may depend on relaxation of the womb, or on the retention of some part of the after-birth, or of a clot of blood, preventing perfect contraction; or it may arise from fright or excitement. Massage of the uterus through the abdomen and drachm doses of liquid extract of ergot are the means of relief. Medical aid should be sought without delay.

9. CONVULSIONS may occur before, during, or after labour. A clothing should be loosened, the patient should be allowed plenty of fresh air, and the face should be sprinkled with cold water. To prevent the tongue being bitten, a piece of soft wood should be held between the teeth. If the head is hot, cold applications should be used to the forehead. Medical aid should be obtained.

10. LACERATION OF THE PERINEUM. The necessity of supporting the *perineum*, or that portion of the person of the mother exposed to pressure, as the head passes, has been mentioned at p. 457. But in first labours, notwithstanding support, some amount of tearing often occurs. This is of little consequence as it quickly heals, and no treatment beyond cleanliness is required. But in exceptional cases the tearing may be greater; and if the wound exceeds an inch the patient should be kept in bed with her legs tied together, the wound being frequently cleansed until healing occurs. If possible a doctor should be summoned to repair the tear.

11. PUERPERAL FEVER. This is a very dangerous fever, sometimes occurring after confinements. It depends on poisoning of the blood from the absorption of putrid matter retained within the womb. When a woman, on the third day after labour, is seized with shivering, and this is followed by a hot and sweating stage with feelings of relief when the discharge or 'cleansings' are passing freely it may be mild and temporary sepsis and of little consequence. But when, after perspiration, no relief is experienced, when the breasts become flabby and smaller, when the discharges lessen or cease altogether, and when the pulse remains above 120 beats in the minute, the case is one of puerperal fever, and suppression of milk, difficulty in breathing, and prostration will soon appear. Pain and tenderness

of the abdomen are very frequent and prominent symptoms. There is bilious vomiting, thirst, and profuse perspiration. The tongue and breath are foul, the face sallow, and there is probably diarrhoea, marked by the passage of hard lumps of faecal matter. At a later period *pyæmia* may occur, and one or more of the joints may become swollen and painful. Puerperal fever is a septic infection, which is readily carried from one lying-in woman to another, unless rigid antiseptic precautions are observed. The first essential is to obtain skilled medical aid.

12. **MALARIOUS POST-PARTUM FEVER.** At a later date than that on which *puerperal* fever occurs, women after delivery are, in the tropics, liable to attacks of ordinary ague and 'fever' to which the above term has been applied. In malarious patients give quinine as soon as the child is born. If malaria occurs, it does so after milk has been secreted, the secretion of milk is not checked, and there is no tenderness of the abdomen as in *puerperal* fever. It should be treated as ague.

13. **PHLEGMASIA ALBA DOLENS**, or *white leg*, is a painful swelling of one or both legs, beginning generally in the thigh and extending downwards to the leg. It may come on from one to five weeks after delivery, with shivering, fever, thirst, quick pulse, nausea, furred tongue, and pain in the loins. The swollen part is hot and tender, and presents a pale, shining appearance, while the power of moving the limb is nearly lost. Such cases generally do well, although recovery is tardy; and the limb may be stiff years afterwards, with tenderness, perhaps the feeling of a cord beneath the skin down the inner part of the thigh, and swelling of the leg. The swollen part should be wrapped in cotton wool; Saline purgative (Prescription No. 60) should be given while pain may be relieved by Aspirin grains 5. The leg must on no account be rubbed but should be raised on pillows, the foot being the highest part so that the circulation in the foot may not be impeded. Generous diet and tonics will be necessary.

14. **PUERPERAL MANIA** occasionally attacks women shortly after child-birth or at the period of weaning, especially where there has been *over-nursing*. It may commence with a little feverishness or it may follow convulsions or *puerperal* fever. It is often characterised by loquacity, laughing, singing, obscene talk, sometimes a tendency to murder the child, and it often terminates in melancholia. If there is any hereditary family tendency to insanity, recovery may be delayed indefinitely, but in most instances a few weeks restore the patient. In the majority of cases there are faecal accumulations in the lower bowels, for which aperients and injections are required. The infant should be artificially fed. Tonic medicines, nourishing diet, and careful nursing are necessary, and bad cases will require special restraint against homicidal or suicidal tendencies. As the disease is liable to recur, and as debility favours an attack, a woman who has once suffered from *puerperal* mania should never nurse again.

Diseases of Pregnancy. *Indigestion during Pregnancy.* The occurrence of nausea and vomiting during the early months of pregnancy is so common that it has been mentioned as one of the symptoms of pregnancy. As the nausea usually comes on when the woman begins to move from the

recumbent position in the morning, and either before or shortly after leaving her bed, it is usually known as morning sickness.

Treatment. Simple morning sickness needs no treatment, but if it troubles the patient she should take a small cup of tea and a piece of dry toast before sitting up in bed in the morning. This, associated with the regulation of the bowels, is usually all that is required.

When vomiting and nausea continue all day the patient should be kept quiet in bed, nourishment in the shape of albumen water and whey should be given in very small quantities frequently. The patient should suck ice or take sips of very hot water to relieve the thirst, and a mustard plaster on the pit of the stomach may relieve the trouble. Medical advice must be obtained.

Constipation is of very common occurrence in pregnancy and if allowed to persist may lead to far-reaching results for mother and child. The importance of the regular action of the bowels is considerable at all times, but during pregnancy it is even more marked, as the waste products of both mother and child have to be eliminated through the maternal system. Two subsidiary conditions are often found associated with constipation, these are heart-burn and flatulence. Heart-burn is the result of imperfect digestion of food, and though not actually caused by constipation is greatly aggravated by it. Flatulence is usually due to abnormal decomposition of food in the bowels, a process which is necessarily promoted by constipation.

Treatment. Regulate the diet, give fresh fruits, vegetables, salads, brown bread, jams, and preserves. Give plenty of fluid to drink, as if there is insufficient fluid the intestinal contents become dry. In many cases of constipation great benefit is derived from large draughts of water before going to bed, and in the morning while fasting. If it be found impossible to regulate the bowels by such means, laxatives should be tried, or enemata, and as a last resource purgatives must be administered. Apenta water, one wineglassful every morning fasting, or a Cascara pill 2 grains at bed-time may be given. Castor oil should be avoided as it constipates after the first purgation. To relieve heartburn give suitable and easily digested foods and carminatives such as Prescription No. 57 or No. 34.

Excessive flatulence may be relieved by soda-mint or ginger-mint tablets, two to be taken as necessary.

Neuralgia occurring especially over the face is common in pregnancy. In the case of diseased teeth extraction or stopping according to circumstances should not be deferred on account of pregnancy. For simple neuralgia iron and quinine mixture is useful (Prescription No. 51). Liniment of aconite applied externally may be used.

Salivation is not common. Astringent mouth washes, e.g., alum lotion or tannin lozenges may be useful.

Faint feelings may be felt about the time of the quickening but are not troublesome in healthy women. A teaspoonful of sal volatile and the recumbent posture for a short time are all that is required.

Swelling of the legs. When the legs are swollen, and 'pit' or show an indentation when pressed on, the patient should lose no time in putting herself under medical treatment, as this is sometimes due to disease of the kidneys, which will need careful treatment.

Cramps of the legs are not uncommon, and are due to the altered pressure of the enlarging uterus on the veins from the lower limbs.

Varicose veins of the legs and of the rectum (piles) are common in the later months of pregnancy. If the large veins of the legs are much swollen, an elastic stocking or bandage may be worn, and the patient should rest with the legs up as much as possible. For piles the bowels should be carefully regulated, and all long standing and excessive exercise should be avoided. The stools should be kept soft, and after a stool a couple of teaspoonfuls of Burroughs and Wellcome's hazeline diluted with half ounce of water may be injected with a small rectal syringe. If the piles are inflamed a hot compress or bread poultice may be applied and is most soothing: after this hazeline ointment should be freely used.

Irritation of the Breasts. Almost from the onset of pregnancy there may be a sense of fulness and tenderness in the breast, some times with darting pains referred to the nipples. By the second month enlargement of the breasts may become noticeable. The breast has a knotty feel due to the growth of the milk glands. In the later months blue veins may be seen under the surface of the skin. There may be a watery discharge from the nipple.

During the later months of pregnancy, especially before the first confinement, the nipples should be bathed twice daily with equal parts of eau-de-Cologne, or brandy-and-water

and they should be gently pulled out by the fingers. Any flannel covering worn over the nipples should be dispensed with. It is also a good plan to expose the nipples to the air for some hours daily. These measures prevent cracking during suckling, render the nipple harder and longer, and therefore more easily accessible by the child's mouth. When the breasts are very heavy and tender they may be slung by a handkerchief passing under each breast and tied over the opposite shoulder.

Irritability of the bladder is common during the early months, and is the result of the increased pressure of the womb on the bladder. The patient should not drink too much fluid, and should avoid tea. The trouble will pass off naturally in a month or six weeks after its beginning.

Retention of urine is uncommon except when pregnancy takes place in a backwardly displaced uterus. The patient should send for medical assistance quickly, as a catheter will have to be passed and the womb put into position.

Pruritus. Irritation of the private parts may be due to eczema. The bowels should be kept acting freely, and the discharge should be frequently washed away. Borax 10 grains to 1 ounce of water, carbolic lotion 2 grains to 1 ounce, liquor plumbi subacetatis, lead lotion, may all be used, as they are soothing.

Miscarriage. *Miscarriage* occurs some time before the sixth month of pregnancy. If the child is born after that time it is called *premature labour*. The most usual period for *miscarriage*, usually called *abortion* in the early months, is about the third month, and it is thought more likely to happen about the time corresponding with what would have been the natural monthly period had not pregnancy occurred. When it has once occurred it is very likely to happen again; indeed, in some women it becomes a habit. The causes are various, often depending on debility, and often brought on by imprudence in horse exercise, dancing, or from excitement, from passion or fright. It also frequently results from blows, falls, or concussions, such as missing a step coming downstairs, bumps in a carriage, jolting in a dandy, &c. In other instances it is due to local weakness or disease of the womb. Attacks of dysentery often lead to miscarriage; also abuse of purgatives. There is in some women an inherent weakness of constitution, which prevents pregnancy passing on to the full time. Attacks of malarious fever add to this weakness, rendering miscarriage in such persons an ordinary sequence of conception.

Syphilis also accounts for many miscarriages and when this disease is present the woman should undergo proper medical treatment for the disease all through the pregnancy. This is the only way to obtain a living healthy child at full term.

Symptoms. When threatened with a miscarriage the patient experiences a sense of uneasiness, languor and weariness with aching pain in the back, loins and hips, and a slightly bloody discharge. After these symptoms have lasted a variable time there are pains very like those of labour, often vomiting, and sometimes profuse bleeding, the blood passed being of a vivid red colour. This may continue for several days, the pain and bleeding recurring at intervals; or the miscarriage may commence suddenly, and the whole be over in a few hours. If the pregnancy is less than 3 months the ovum is expelled as a whitish shaggy oval mass about the size of a small egg, containing all the products of conception; but, if the duration of pregnancy is 3 months or more, frequently there will be a small foetus expelled and the after-birth will be left behind. In this case medical aid must be summoned. If the whole ovum has been passed the pain and bleeding will cease. If even a small portion of the ovum is left behind it may cause trouble in two ways:

1. By irritating the uterus and causing frequent attacks of bleeding which lead to great weakness.

2. By becoming decomposed and setting up blood poisoning which might be fatal.

Treatment. Medical advice should be obtained early in cases of miscarriage, because it is more serious than labour at full term. In cases of threatened miscarriage the patient must go to bed at once and not get up for any purpose. A bed-pan should be used. Cleanliness is of great importance and the privates should be sponged down frequently with Lysol lotion 1 teaspoonful to 2 pints, or Mercuric lotion 1 in 2,000. The foot of the bed should be raised on bricks. Strong purgatives must not be used. A glycerine suppository, preceded the night before, if necessary by a dose of Cascara, is the best means of overcoming constipation. Liquid extract of Viburnum helps to quiet down the uterus, a teaspoonful may be taken every 4 hours in hot water. If the above treatment is successful, pain and bleeding gradually cease and the danger of miscarriage passes off. The patient may get up after the bleeding has stopped for a week. If all efforts to avert miscarriage fail the pain and bleeding increase, clots

are passed and finally the whole products of conception may come away. It is most important to keep everything that comes away for inspection of the doctor or nurse, as he or she will want to decide if the miscarriage is complete or not. If it is complete no interference is needed, but, if not, a small operation will be necessary to empty the uterus at once. After a miscarriage the woman should remain in bed 7 or 8 days and then return gradually to her employments. Getting about too early after a miscarriage is often the origin of some malady of the womb from which the woman may long suffer.

CHAPTER XV

MANAGEMENT OF THE INFANT AT BIRTH

Treatment after Birth. As soon as the child's head is born, the eyes should be wiped clean with a piece of soft linen, which should have previously been put ready to hand for the purpose. A clean piece of old handkerchief is suitable for this. It is important to wipe the eyelids immediately, as otherwise the discharge from the maternal passages or the cheesy material on the eyelids may get into the eyes when the infant opens them and may irritate and cause inflammation of the eyes. When the body is born the mouth is wiped out to clear out any mucus or froth from the back of the throat, and the baby is then put in such a position that it may not be smothered by the bed-clothing. Then, provided the child cries vigorously (which it will probably do unless it is stillborn), the cord should be tied and cut. The best ligature material for the navel cord is a piece of surgical silk, but if this is not at hand an efficient substitute may be provided by making a strand of eight to ten thicknesses of sewing-cotton or linen thread. If the material used for the ligature is too thin it may cut through the cord instead of tying it. The ligature should be tied as tightly as possible round the cord at a distance of $2\frac{1}{2}$ inches from the navel.

Unless the child is stillborn it is not necessary to hurry over tying the cord; it is better to wait until the beating in the cord has ceased, as by this the child receives more blood from the placenta and is more vigorous. As soon as the cord has been tied it should be cut about $\frac{1}{2}$ inch beyond the ligature; if there is any oozing of blood from the cord it should be tied again with another ligature. When the child has been separated from the mother it should be wrapped up in a warm blanket or piece of flannel and put away in a safe place while the mother is being attended to. Care should be taken lest the child slip and be injured; to guard against this, the back of the infant's neck should be held in the space between the thumb and first finger of one hand, while the thighs are

grasped with the other. Warmth is at this time of importance, as the infant has just passed from the temperature of the mother's body (98·4° Fahr.) into a colder atmosphere. but the eyes must be guarded from glare if it is put beside a fire. The eyes should be carefully washed with warm boric-acid lotion (Prescription No. 14), or failing this, with plain boiled water.

As soon as the warm bath is ready the infant must be washed thoroughly, but before the bath the infant's body should be anointed all over with sweet oil to remove all the sticky, cheesy material which is found on so many babies. Special care must be taken to remove this material from the folds of the joints and from the top of the head, as the infant is likely to get irritation of the skin or eczema if this is neglected. When the body has been oiled and the cheesy material removed the infant is soaped all over and is then immersed in a bath of water. The best soap to use is Castile soap, or Wright's Coal Tar soap ; carbolic should not be used, as it may irritate the tender skin. The temperature of the bath-water should be 98° Fahr., and if a thermometer is not at hand the elbow will afford the fairest test of the degree of heat, the hand not being sufficiently sensitive. The oiling and bathing of the child must be done quickly (it is possible to do it within four minutes), in order to avoid undue exposure of the child. It must be remembered when washing or lifting the child that its bones are soft and unable to sustain the weight of the body. It should therefore be allowed to rest on the bath, and never held up by one or both arms. In washing the face and head, care must be taken that the soap or soapy water does not get into the child's eyes, as this might cause inflammation of the eyes.

After the bath the babe is put on the nurse's knees, and gently dried with soft warm towels (old ones softened by many washings) and then the cord is again looked to ; if the ligature appears to be loose a fresh ligature must be applied ; the cord shrinks in water and unless it is looked to the first ligature may slip off and the infant lose a considerable amount of blood. The ligature is cut off near the knot and the cord is dressed. A piece of clean soft rag is doubled and cut in a circular shape 4 to 5 inches in diameter. In the centre of this a hole is cut through which the cord is drawn, it is then folded in the cloth and the mass is then laid against the child's body, in which position it should be kept by the belly band. After this

binder is applied two fingers should pass easily beneath it, the object being not to impede breathing but simply to maintain a slight pressure over the navel, which at this period is the weakest part of the infant's body. The dressing of the cord should be removed and renewed daily. In three to ten days the navel string dries up and comes off, leaving a small sore which heals quickly. The cord should not be pulled off nor interfered with, but should be left to drop off by the natural process.

As soon as it has had its first bath the babe should be put into its cot, covered with a blanket and surrounded by hot-water bottles if the weather is cold, and allowed to go to sleep. When it wakes in five to six hours it should be put to the breast, as this promotes the contraction of the uterus and stimulates the secretion of milk in the breast. The milk first secreted has natural aperient properties, and therefore the babe does not stand in need of drugging with castor oil, treacle, or any other purgative medicine. It is only when the first milk of the parent is not obtained, owing to the child being put to a wet nurse, or in cases of premature birth when no milk is at first secreted, or from the first milk not being sufficiently purgative, that the administration of any medicine is desirable. Then half a teaspoonful of castor oil with half a teaspoonful of olive oil is the best aperient. The bowels of a new-born infant contain a greenish-black tarry substance called meconium, which generally begins to pass a few hours after birth, often with the first flow of urine, and continues to pass at intervals for thirty-six hours. In the great majority of cases the purgation caused by the first milk, colostrum, is enough to clear the bowels; and medicine, by causing diarrhoea, will do more harm than good. If the stools remain black on the third day the aperient given to the mother on that day will probably effectually clear out the child's bowels.

Food. The practice of feeding a full term infant immediately after birth is strongly to be deprecated. A healthy infant requires no nourishment except that which it gets from its mother. If food was essential to the child during the first thirty-six hours, nature would probably have taken care to provide it. There is sufficient secretion from the mother's breasts to serve the scanty wants of the child. If after the first 48 hours the milk secretion is not established the infant will need supplementary feeds. It must still be put to the

breast regularly 3 hourly, but after each breast feed 1 ounce of one of the following should be given :

- (a) Whey.
- (b) Glaxo or Cow & Gate.
- (c) Diluted milk.

Whey is the most easily digested by a new born baby and is made as follows :

Take 9 ounces of fresh milk in a jug. Place the jug in a pan of water and heat it until the milk is 105°. Then stir into it a teaspoonful of rennet or pepsenica. Allow it to stand for 5 minutes. A firm curd will form. Break it up with a fork and strain off the fluid part (whey) through a piece of freshly boiled muslin. Cool down quickly and stand in an ice-box in the hot weather or a cool well ventilated place in the cold weather. Two tablespoonfuls of whey warmed to 98° F. should be given to the baby every 3 hours and a fresh quantity prepared every 12 hours. If the infant is premature 2 or 3 teaspoonfuls of the whey should be given every 2 hours as the premature baby being a weakling cannot stand any prolonged deprivation of food.

After the mother's milk appears, the infant should obtain nourishment from this source alone. When suckling, the mother should lean over and support the breast, allowing the nipple to fall into the babe's mouth. During the first month the child should be fed every three hours by day, and once at night. The feeds should be so timed that one is given at 11 P.M., and the first morning feed at 5 A.M. After the first fortnight, by care and firmness the habit of not suckling from 10 P.M. till 6 A.M. may also be acquired, to the great comfort of the mother. Very often when an infant cries it is from thirst not hunger, and it should be given 1 to 2 teaspoonfuls of cold boiled water. The infant should be applied alternately to each breast. Sometimes a child, for some inexplicable reason, prefers one breast, and the mother, to avoid contention, concedes the point ; or in consequence of a cracked or sore nipple the mother puts the child more to one breast than the other : this is most injudicious and is likely to lead to abscess of the neglected breast.

Clothing. The clothing of new-born infants should be light, loose and warm, as the innate power of generating heat is at a minimum in the newly born. Thin flannel, or silk and wool fulfil these requirements better than other textures. The garments should fasten in front, and the skirt should be

attached to the bodice. Sleeves and armholes should be made wide so that there is no twisting of the child's arms into unnatural positions. Infants are frequently caused pain by their tender arms being thrust through narrow armholes, and from their skin being pitted by rough seams and tight garments, or by having pins or needles stuck into them while their garments are being adjusted. Safety-pins should be used, and the body should be protected from harm by slipping the fingers under the binder, &c., before pinning or sewing it.

The child should be put into its cot from the first, and this should be warmed with hot-water bottles and bags if necessary. Failing more elaborate things an ordinary laundry basket makes an excellent cot for a new-born infant. If the child sleeps with the mother it is likely to become unhealthy through not having a continuous supply of fresh air.

Cleanliness and dryness are of the greatest importance. The child should have a warm bath once a day and should have its face, hands, feet, legs and buttocks sponged with warm water in the evening when its night clothes are being put on. The urine of the infant is passed very frequently, and the bowels are often moved, and if wet and dirty napkins are not quickly removed they irritate and inflame the skin and may cause severe eczema. Napkins should never be of waterproof material, should be changed whenever soiled, should always be washed out with fresh water before being dried and used again, and should be fastened with a safety-pin or with broad tapes stitched to the corners. 'Blue seal' vaseline is the best application for chafing. Wet bibs are likely to give the infant cold on its chest and a sore neck. No soiled clothes should be allowed to remain on, and no wet clothes should be dried in the nursery. Mothers should remember that the training of the child can begin when it is one week old, and if they insist on cleanliness the child very quickly understands and will never soil its clothes, but will give warning by crying, which should be attended to at once. The formation of clean habits will save the mother endless trouble besides being much healthier for the child. And suck discipline is easier at the beginning than is the rectification of bad habits once contracted. For the same reason babies should not be rocked to sleep but should be taught to go to sleep when laid in their cots. Nor should they ever be given those pernicious so-called comforters which fill their stomachs with wind and

noxious germs, and can always be relied on to produce indigestion.

[The best material to use for napkins is turkish towelling, but diapers may also be used. No soda should be used in washing the napkins as this is harsh and may cause irritation of the infant's tender skin.]

OCCASIONAL MALADIES AND CONDITIONS AFTER BIRTH. After the birth of an infant various circumstances may give rise to uneasiness.

1. BIRTH, STILL. If the child is born apparently dead, or 'still-born', and does not cry, it may present either of the following appearances: Firstly, the face may appear flushed and livid, the skin red and the cord tense and pulsating. The first thing is to wipe out the back of the mouth with a finger covered with a handkerchief, so as to clear it from sticky mucus or fluid; then tie one ligature round the cord upwards of three inches from the navel. Then place the second ligature round the cord an inch or so below, but do not draw the knot tight. Now divide the cord between the ligature tied tight above and the ligature laid loosely below. The latter is not to be tied tightly until a teaspoonful of blood has escaped. This will often be followed by breathing, the child beginning to cry. If respiration does not take place, the child's body should be sprinkled alternately with cold and warm water, the limbs and spine should be gently rubbed, slight pressure should be made on the chest over the heart, and, lastly, artificial respiration should be tried. Secondly, the face may be pale, the features collapsed, the lips blue, the jaws fallen, the limbs cold, while no pulsation is felt in the cord. In this case the baby is in a state of severe shock. The cord should be divided quickly and tied and the baby wrapped in a warm flannel. The mouth should be cleared of mucus and the baby then immersed in a warm bath at 98° Fahr. A little diluted brandy may be rubbed on the baby's lips, spine and chest. If the baby does not show any signs of breathing, after a few minutes, gentle artificial respiration should be tried, but on no account must the baby be slapped or sprinkled with cold water. The baby is in a state of shock and very gentle methods are necessary to save its life.

2. BREASTS, SWOLLEN. In some infants, a few days after birth, the breasts (boys and girls) are found swollen, and a whitish fluid is observed on the nipple. The swollen part should *not* be squeezed, which would cause a 'gathering'. Unless, from dirt or undue handling by ignorant persons, signs of inflammation appear, no application is necessary. Slight inflammation is often checked by a cold-water compress, held in place by a wide bandage.

3. COLD IN THE HEAD is common, some infants sneezing immediately they are born. To avoid this, infants should be kept out of draughts.

4. CLEFT PALATE. This means that the roof of the mouth is split. When this occurs to any extent the child cannot suck, and therefore cannot be fed in the ordinary way, as the food passes back into the nostrils instead of down the throat. The infant must be placed in a semi-erect posture and fed with a spoon or soft rubber tube, and the food must be tilted suddenly down the throat. The milk will then be swallowed without passing into the nostrils. But, as soon as possible, nipples provided with artificial tongues or palates should be procured. With care an infant with cleft palate may be well nourished, but the

defect should be remedied by surgical operation as soon as possible.

5. **CONSTIPATION.** Give cooled boiled water, 2 to 4 drachms, three times daily, honey $\frac{1}{2}$ drachm, or extract of malt or olive oil $\frac{1}{2}$ drachm, two to three times daily.

6. **CYANOSIS.** In exceptional cases this condition may be present. The whole surface is preternaturally dark, and cold to the touch. It depends on an organic defect in the heart, and is incurable, although the child may live for some years. It may be only temporary.

7. **HEAD, ALTERATION OF SHAPE OF.** From pressure during birth, especially if forceps are necessary, the shape of the head may be altered, the face may be disfigured, or bluish swellings may be raised on the scalp. This need not excite apprehension. The head, or face, will gradually assume its natural shape, and swellings about the scalp seldom require more than bathing daily with water.

8. **LOOKJAW AND TETANUS.** Due to infection of the navel.

9. **'NAVEL-STRING', BLEEDING FROM THE.** Arises from the cord being carelessly tied or from tapes being used, which are liable to slip. The proper treatment is another ligature below the first. Or the bleeding may come on when, after six or seven days, the 'navel-string' separates. To stop this bleeding, pressure should be applied by placing some absorbent cotton-wool, or boracic lint, on the part, and a wide bandage. If this does not succeed, alum (20 grains to 1 ounce of water) may be applied under the pad with a camel's-hair brush.

10. **NAVEL, ERYSIPELAS OF.** Not likely in clean children.

11. **NAVEL, ULCERATION OF THE.** In some cases the navel remains red or ulcerated, presenting 'proud flesh', and the irritation may give rise to convulsions. This is generally easily cured by the use of alum wash and simple 'dressing' under the bandage.

12. **OPHTHALMIA.** The eyelids stick together after sleep, the edges are red, the eyes are closed when exposed to light, the lids swell, and 'matter' is discharged. This is often due to uncleanness, or to infection from the maternal passages, or to soap getting into the eyes during the first washing, or by the infant, from lying in bed with the mother, getting perspiration or sour milk in its eyes. The treatment is perfect cleanliness, frequent bathing and syringing of the eyes with boric acid solution, 10 grains in 1 ounce of water, smearing the lids with vaseline to prevent them sticking together, and keeping the child in a darkened room (see p 407).

13. **SPINA BIFIDA.** This is a malformation of the spine, with protrusion, in the form of a tumour, on the lower part of the back. The part should be protected from pressure, and it may gradually solidify. It should be shown to a surgeon at the first opportunity.

14. **SUFFOCATION OF INFANTS.** Care must be taken that a child's bed-clothes do not smother it. Even the close wrapping of a child's head in a shawl to protect from cold may effectually smother it, without any convulsive struggle as indication of what is taking place. The mother should never go to sleep while suckling, as, the child's face being pressed on the breast and both being asleep, the child may be slowly suffocated. To keep a child quiet a bag of wash leather or of linen containing sugar is sometimes thrust into its mouth, which may also lead to suffocation. It is an inexcusable practice.

The superstition that cats suck the breath of infants is not well

founded. They may lie on the face or accidentally draw some article of clothing over the face, and so cause suffocation. The moral, however, is the same : never to leave an infant in a room with a door or window open or a cat therein.

15. **THRUSH, OR WHITE MOUTH**, due to want of cleanliness, can be avoided by washing out the mouth before and after feeds with boric acid lotion.

16. **TONGUE-TIE**. If the infant sucks and protrudes the tongue at all over the lower lip it is not *tongue-tied*, even although for some days it may not suck vigorously. 'Tongue-tie' depends on the fold of membrane (or *frænum*) beneath the tongue being too far forward, and it may be seen in some cases extending nearly to the tip of the tongue, which cannot be raised by passing a finger under it, while the milk flows out of the mouth. The method of relief is the partial division of this structure, for about one-eighth of an inch or less, with a *blunt-pointed* pair of scissors. The snip with the scissors should be directed *downwards* towards the jaw, not upwards to the tongue, to avoid cutting a blood-vessel passing through the part, from which, when cut, a troublesome bleeding has proceeded. The operation is not advised in the absence of a doctor unless in very bad cases ; and the infant must be fed with a spoon, if possible with the mother's milk, or, if not obtainable, with *milk-and-water*.

17. **URINE, ACIDITY OF**. Infants sometimes expel urine frequently, although only a few drops at a time. This usually depends on irritability of the bladder caused by acid urine. The small amount passed quickly dries on the diapers, and there is no evidence, by wetting, of urine having passed. But the urine is highly coloured and leaves a stain which may be mistaken for blood. Two or three grains of citrate of magnesia should be given twice a day.

18. **URINE, RETENTION OF**. Sometimes infants make no water during the first twenty-four hours. When this is the case and the infant appears in pain, crying and drawing up the legs, a warm bath, or fomentation over the lower parts of the bowels, will prove successful. If a male, draw back the foreskin and wash away any foreign matter.

19. **VOMITTING**. Some infants vomit *immediately* after suckling, the milk returning unsoured or without evident cause. This probably depends on a copious supply of milk, which the infant takes too fast or in too large a quantity. A finger should be placed near the orifice of the nipple, to prevent too rapid flow.

20. **'RED GUM' AND JAUNDICE**. 'Red' or 'yellow gum' is the term popularly given to discolorations of the skin, which may occur to infants two or three days after birth. But all instances of discoloration of the skin are *not* jaundice, as the surface is often discoloured from the blood being congested in the skin, probably from the effects of cold or owing to pressure from protracted labour, and such discoloration requires no treatment. When jaundice occurs the child's skin is yellow, the whites of the eyes are yellow, the urine is dark, staining the clothes yellow, and the 'stools' are white. If the eyes are yellow, and if white linen is stained yellow by the urine, there is jaundice. As a rule no medicine is required, the first milk of the mother being sufficient to open the bowels of the infant. In bad cases, when the whites of the eyes are yellow and the bowels

constipated, half a teaspoonful of castor oil may be given. It is some days before the skin loses the yellow tinge.

EXAMINATION OF INFANTS. It is often difficult for a mother to know exactly when her infant first becomes ill, or even in some cases to be sure that it is really sick. It is also difficult to decide whether a fit of crying is due to bad temper, to passing discomfort, or to disease.

The *general demeanour and expression* are instructive. A flushed or a pale face, disinclination to play, drowsiness by day and restlessness at night, and unusual fretfulness, are signs of approaching illness, and may signify possibly *ague*, or other maladies soon to be declared by their distinct symptoms.

The *cry of an infant* is often very characteristic of the malady from which the child is suffering. The cry of passion is a furious one; the cry of sleepiness is a drowsy one; when roused from sleep there is generally a sobbing cry; a shrill cry denotes hunger or thirst, and is often accompanied by movements of head and hands, as if seeking the breast; the cry of teething is fretful and intermittent; an infant with earache will cry in short, piercing tones, putting the hand to the affected ear, pulling at it, and perhaps rolling the head. If after giving a baby suitable nourishment or a drink of water it still keeps up a continued cry, there is probably pain in the ear. Bowel complaint causes a straining cry, with drawing up of the legs; in bronchitis the cry is gruff and husky; in inflammation of the lungs it resembles a moan; in croup the voice is hoarse, and the breathing sounds as if drawn through muslin; in inflammation of the brain the cry is often a piercing shriek at intervals, alternating with moaning and rolling of the head from side to side. It should not be forgotten that crying may arise from a pin pricking or a tight string or a rough fold of clothing.

When necessary to examine a child, as to the existence of tenderness in the bowels, for instance, it is useful to bring the child suddenly before a bright light, as one of the apparently greatest pleasures of an infant consists in gazing at such an object. It almost always ceases to scream, and continues quiet while thus attracted, when the abdomen may be examined by gentle pressure with the fingers. If the pressure causes the child to cry out, with frowns or contractions of the countenance, there will probably be some condition affecting the bowels.

If during illness a child, especially an infant, sleeps, it may be accepted as an indication of a mild form of disease or of a diminution of serious symptoms. With regard to the administration of medicine to children, if they are old enough, appeal to their reason, for if children are deceived they will soon become suspicious, and future trouble will be entailed. If too young to be reasoned with and children will not take medicine, they should be compelled. Let a refractory child be laid across the knees, the hands, *nose*, and feet being tightly held. Then by means of a medicine spoon, or other spoon pour the dose into the mouth, and it must be swallowed. Medicine should be made as palatable as possible for children, as giving nauseous doses is quite unnecessary and excites a child, the passion probably doing more harm than the medicine, forcibly administered, does good.

The average weight of an infant at birth is 7 lb., and the average length 18 inches.

It may also be mentioned that tears are not shed by infants until they are from three to four months old, and that the eyes of infants

are blue up to the sixth or eighth week of age. If no 'motion' is passed in the first twenty-four hours, examine the anus ; it may not be properly formed and may require attention from a surgeon.

Feeding of Infants: Proper Food, Milk. Although a tropical climate is not so fatal to infants of European parentage as once supposed, still an amount of carelessness as regards food, which in England would give rise only to minor maladies, will in India become the cause of fatal disease. But with care as regards feeding, and under good hygienic conditions, there is no reason why European-born children should suffer from passing the first years of their life in the tropics. At the time of birth the digestive organs of the child are in an immature state, and it is only gradually that their powers become developed. For the first few months no saliva is secreted, there are no tears, and the glands in the stomach act feebly if at all, and the alimentary canal is comparatively short. The teeth do not appear until the lapse of several months. All conditions point to feeble digestive capacity, and evidence that the food must be specially adapted to the digestive powers. Of such food *there is only one kind, namely, milk.*

Women should suckle their Children. It is in accordance with nature that a *healthy* woman should suckle her offspring. The avoidance of this duty often reacts injuriously in various ways on the system of the mother. As nursing, generally speaking, prevents conception up to the tenth month, so it prevents the ruin of the mother's constitution by too rapid child-bearing. Moreover, it is advantageous to the breast that their natural functions should be carried on, and may probably prevent the future development of breast diseases. Many women, though desirous of nursing the child, find that they cannot do so when they rise after the lying-in period ; this is especially the case if the mother has nursed the child at two-hourly intervals by day and night. It is most important that a nursing mother should have six hours uninterrupted rest at night, therefore she should form the habit of not nursing the child at night from the earliest possible date. If the milk supply shows signs of failing when the woman rises after lying-in she should take as generous a diet as she can digest. A meat diet increases the proportion of fat and protein. Beer, ale, and porter and other malt liquors, especially alcoholic beverages, are more harmful than beneficial ; they may increase the quantity of milk, but its quality

is deteriorated. Systematic nursing with strict observance of stated intervals is essential for its influence upon both the quantity and quality of the milk secretion. Bathing the breasts alternately with hot and cold water will often improve the flow of milk.

These remarks apply only to healthy women; there are certain conditions of system, such as a consumptive tendency, which forbid nursing.

The Question of supplementing Mother's Milk by Hand-feeding. When the mother finds her milk inadequate to supply the wants of the child, the question arises whether the mother's milk cannot be supplemented by hand-feeding. Many mothers are averse to delegating the duty of suckling to other women. In the minds of some people there is an objection to their children being suckled by a native woman; but although the mother who bears a child may possibly impress constitutional peculiarities on it, the milk of another cannot subsequently do so. Others, again, may be unable to bear the expense of a wet-nurse or 'dhai'; or a suitable wet nurse is not procurable. Such circumstances must sometimes lead to *supplementing* the milk of the mother by hand-feeding. It sometimes happens, however, that when the milk is not sufficient for the wants of the infant, it is also more or less deficient in qualities on which its nutritive properties depend, and it may be therefore unsuited for use. The limited supply may show that the constitution of the mother is unequal to the task, and milk of the best quality cannot be secreted by a person whose constitutional powers are failing. However, a partially breast-fed child is as a rule healthier than an entirely bottle-fed child, and, provided the mother's health is maintained, it is permissible to supplement the breast by the bottle. If this is not done, a wet-nurse should be employed. But if from any cause a wet-nurse cannot be obtained, it will be advisable for the mother to leave off suckling and to trust to hand-feeding.

The Composition of Milk, and the Selection of a Wet-nurse. One hundred parts of milk contain nearly ninety parts of water, the remaining being solid constituents, as *casein*, which is a protein, sugar, fat, and various salts. The milk of women is liable to certain natural changes at different periods of suckling. The first milk differs from that afterwards formed in containing slightly purgative principles. Until the end of the first month the amount of sugar is less than afterwards,

and the *casein*, or *protein* matter, is presented in a more easily digestible form than subsequently. From the eighth to the tenth month sugar is in excess. Casein is most deficient during the tenth and eleventh months, and most abundant during the first two months. During the first month there is also more butter, or fat, and salts than at any other period.

From the above it is evident that when *selecting a wet-nurse* one of the requirements should be that the milk should have commenced about the same date as that of the mother. The general health of the woman should be attentively considered; her teeth should be good and her breath sweet; and freedom from piles, from enlarged spleen, and from *any skin disease* must be ascertained. If either the woman or her husband has suffered from prolonged sore-throat, she should be rejected, as it is probably venereal*. The condition of the candidate's child should be examined, and the mother of a weak, puny, badly nourished infant should be rejected, especially if there are sores about the buttocks, 'privates', or corners of the mouth, which are also probably venereal. No woman who has suckled any other than her own child should be engaged unless the child is seen, for a woman may contract disease of the breast from one child and convey it from her breast to another. It should also be ascertained that there is no epidemic disease where the woman comes from, as small-pox, scarlet fever, or measles. The condition of the woman's breasts should be examined. They should be round, prominent, with veins visible, and affording a rather hard, knotty feeling. It is not necessary that the breasts should be large, as those of a moderate size often furnish most milk; but it is important that the nipples should be well developed and projecting and free from sores. A little milk should be procured, which should present a bluish-white colour and possess a sweet taste. If tested with litmus-paper it should afford an alkaline, not an acid reaction; and if examined under a microscope, all globules should be seen floating about separate and free, and not massing together. Allowed to stand a few hours, it should give a thin film, resembling cream. Dropped into water, healthy human milk should form a cloudy mixture, and not sink in thick drops. The goodness of the milk may also be judged of by observation of the nurse's child. If it sucks heartily, the milk is most likely good; if it sucks laboriously, desists and cries, the reverse is probably the case. Inquiry should be made as to whether the woman has been 'unwell' since nursing, for if so the milk is never so good, and will probably soon stop altogether. It is also important to know whether the nurse takes opium or is taking any drug which may affect the infant through her milk. Although the age of the wet-nurse's child should as nearly as possible correspond with that of the infant requiring wet-nursing, the age of the wet-nurse herself is not so important a matter. A woman from twenty to thirty years old is advisable. Native women commence having children at an early age, and cease to do so proportionally early; and neither a very young girl nor a woman approaching the termination of her child-bearing era is desirable. The woman should be of temperate habits, not addicted

*The blood should in all cases be tested for syphilis.

to over-eating or to drink. In certain parts of India a moderate indulgence in tobacco-smoking must be permitted, as some women—Bheels, for instance—will rarely take service if debarred from the customary pipe. Cleanliness, equanimity of temper, cheerfulness, and an open, frank disposition are to be greatly desired. Lastly, the association of the woman with her friends and relatives should, if practicable, be stopped. If she becomes 'unwell' or pregnancy occurs, the child should be taken from her. When a change of *ayahs* has to be made, the woman should not be told until a successor is at hand, as the tidings, perhaps exciting the woman, may influence the milk, and so injuriously affect the child.

The possibility of *deception* should be held in view. A woman by drinking largely, and by allowing the milk to accumulate, may present for a time the appearance of breasts well supplied with milk, while in reality the daily amount secreted is not sufficient for a healthy child. Such deception may be suspected, when a thin, feeble-looking woman appears with overflowing breasts. The only sure method of detection is applying a child to empty the breasts and watching the rapidity of the reaccumulation of the milk. It should also be ascertained that a child shown by a wet-nurse is not a borrowed one.

Wet-nursing from Birth. The milk of a healthy woman may be too rich for the delicate stomach of a weakly infant during the first two or three days of its existence. It should in such rare cases, therefore, be fed artificially for the first seventy-two hours; and on the first three or four applications of the child to the 'dhai' it should be permitted to take only a small quantity of milk. If a wet-nurse, confined at the same time as the mother of the child were available, the precautions as above would not be required, but this can rarely be the case. It is in instances of the kind, when the child does not take the first milk from the mother, that some aperient dose may be necessary.

It occasionally happens that, from some unexplainable cause, the milk of one woman disagrees with a child while that of another woman suits. Such exceptional cases may be suspected when, after regulating the diet of an apparently healthy 'dhai', and after any costiveness of the bowels of the woman has been removed by castor oil, the child still does not thrive. Under such circumstances a change of nurses may be necessary. But alterations of the kind are often attended with much trouble and expense, and therefore should not be made on insufficient grounds. Very frequently when an *ayah's* milk disagrees, the reason may be found in the fact of the woman on becoming an *ayah* being able to indulge in a richer diet, while leading a more lazy life. Owing to the anxiety of parents that the nurse of their child shall be strong, too much or too rich food is often provided, the result being a change in the character of the milk, which therefore disagrees with the child. The fact of a child not thriving so well as could be wished cannot be immediately accepted as a reason why artificial feeding should be substituted, but must be regarded as indicating some dietetic error requiring

amendment, and the desirability of some exercise and employment for the woman. Or, the child may not thrive from the fact of the woman surreptitiously suckling her own infant. Or there may be a superabundance of thin poor milk, which is suggestive of its soon ceasing altogether.

Weaning. The propriety or otherwise of weaning a child in India must be considered with reference both to the condition of the child and of the mother or nurse. Speaking generally, weaning should not begin until the child has cut one or more teeth. Weaning should normally take place in the tenth month of life, partial suckling being continued for four to five weeks longer. Weaning may be delayed if the child is weakly, and during or after an acute illness. It is better to wean during the cold weather than in the hot weather or rains, the season of diarrhoea, and not when there is cholera about, nor when the child is actually teething. When weaning is determined on, it should be a gradual process, and should be begun at night. The better way is to separate the child from the mother, and if it cries it may be soothed with some tepid water. It will probably get very little sleep; but by the second night, if the mother *has not yielded*, half the work will have been done. The third night the child will probably sleep, or it will be satisfied with water. The diet thenceforth should be on the lines laid down in the next chapter.

The mother's breasts ordinarily give no trouble when weaning is performed gradually.

Feeding bottles must be kept scrupulously clean, and for this reason the simpler the shape the better. The slipper-shaped bottle now so popular is good for this reason, and also because its shape compels some older person to keep her attention on the child and control the rate of feeding. Some children tend to feed too quickly and suffer from indigestion in consequence. At the same time, because attention is required in feeding a child with this bottle, care should be taken that the nurse is not tempted to hurry the meal so as to betake herself to a more congenial occupation. The old-fashioned feeding-bottle with a long rubber tube was a very bad one: not only was it impossible to clean the tube properly, but the child was left with the bottle to suck at it when it liked. The teats of the feeding-bottle should be conical and easily cleaned: they should be put into warm water and thoroughly rinsed after each meal.

CHAPTER XVI

ARTIFICIAL FEEDING OF CHILDREN

WHEN the infant has to be fed by hand it is necessary to decide on the choice and preparation of the food, the quantity to be given, and the frequency of the feeds.

A. THE CHOICE AND PREPARATION OF THE FOOD

At the present time the choice of food falls into the following divisions :

- (1) Cow's milk modified to resemble human milk.
- (2) Whole cow's milk.
- (3) Dried milks.
- (4) Condensed milk.
- (5) Milk of other animals (fresh or dried).

(1) *Cow's Milk modified to resemble Human Milk.* No amount of modification can convert cow's milk into human milk and the most that can be done, is to bring the quantities of the constituents to a figure approximating that of human milk :

- (a) By dilution and addition of fat and sugar.
- (b) To attempt to modify the curd which is tough and indigestible in cow's milk.
- (c) To boil in order to kill the germs.
- (d) To add orange juice and cod liver oil to the diet, in order to replace the vitamins lost by boiling the milk.

Percentage Composition of Human and other Milks

—	Human	Cow's	Indian Cow's	Goat's	Ass's
Protein :					
Casein	0.6	3.25		3.0	1.0
Lactalbumen	1.4	0.75	4.0	0.7	0.8
	2.0	4.0		3.7	1.8
Fat	3.5	3.5	5.0	4.2	1.0
Sugar (Lactose)	7.0	4.0	4.0	4.0	5.5
Salts	0.2	0.7	0.7	0.5	0.4
Water	87.3	87.8	86.3	87.6	91.3

(a) *Dilution and addition of cream and sugar.* It will be seen from the above table that a dilution with an equal quantity of water will bring the protein to the correct amount. The sugar will however be seriously reduced to 2% instead of 7% and the fat to 1.75% instead of 3%. The addition of one drachm of thick cream to three ounces of milk in the mixture will bring the fats up to the required figure. While the addition of one level teaspoonful (two drachms) of Dextrimaltose (Meads) or Lactose or Sugar, the preference being in this order, will bring the sugar up to the correct percentage.

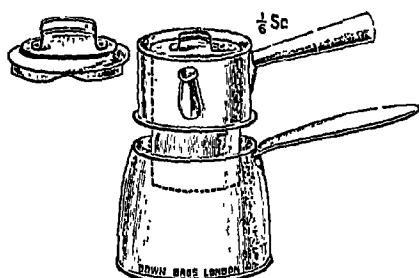


FIG. 38. Milk Sterilizer.

(b) If the mixture is placed in a double saucepan and boiled for five minutes, this both renders it sterile and modifies the curd by making it more digestible. Should further modification of the curd be necessary, it may be accomplished by (1) adding barley water as the diluting fluid (see p. 602). This should not be done before the 6th month. (2) Lime water. Add a teaspoonful to three ounces of the milk. (3) Add one grain of Citrate of Soda to each ounce of the milk, but not more than 5 grains in any one feed. These methods are not usually necessary in healthy babies.

(c) The boiling as mentioned under (b) should be carried out for five minutes in a double saucepan. The milk mixture should only be placed in boiled containers, that is, the feeding bottle, the jugs, the teat, should all be sterilised, by boiling after use and kept in a covered vessel containing boiled water. If the food is prepared in batches it must be covered with meticulous care and kept in the ice chest, and no mixture should be kept longer than 6 hours. It is better to prepare each feed separately. Remember, if the mixture has been kept in ice to warm it and stir it before giving it to baby.

(d) It is necessary to substitute certain vitamins that are destroyed in the boiling of the milk; this is done by giving

baby the juice of half an orange diluted with equal parts of water and sweetened with a little sugar. Half this mixture can be given twice a day and should be started after the baby is two months old. Cod Liver Oil should be given either so $\frac{1}{2}$ a teaspoonful of a good Emulsion¹ (33%) twice a day, or as 6 drops of Ostelin in the day. The Cod Liver Oil can either be given separately or added to the feeds.

Good prescriptions for modified cow's milk are as follows :

At one month :

Milk	.	.	.	.	5 drachms
Water	.	.	.	.	10 drachms
Cream	.	.	.	.	$\frac{1}{2}$ drachm
Lactose	.	.	.	.	$\frac{1}{2}$ teaspoon

At two months :

Milk	.	.	.	.	1 ounce
Water	.	.	.	.	$1\frac{1}{2}$ ounces
Cream	.	.	.	.	40 minims
Lactose	.	.	.	.	1 teaspoon

At three months :

Milk	.	.	.	.	$1\frac{1}{2}$ ounces
Water	.	.	.	.	$1\frac{1}{2}$ ounces
Cream	.	.	.	.	$\frac{1}{2}$ drachm
Lactose	.	.	.	.	1 teaspoon

At six months :

Milk	.	.	.	.	4 ounces
Water	.	.	.	.	2 ounces
Lactose	.	.	.	.	$1\frac{1}{2}$ teaspoons

At nine months :

Milk	.	.	.	.	6 ounces
Water	.	.	.	.	2 ounces
Lactose	.	.	.	.	$1\frac{1}{2}$ teaspoons

Some children will not take cow's casein however diluted, and some of these will flourish on a mixture of cream, whey and lactose. For preparation of whey see p. 475. This recipe will do well for children under 6 months of age :

Whey	.	.	.	.	4 ounces
Cream	.	.	.	.	4 drachms
Lactose	.	.	.	.	1 teaspoon

(2) *Feeding with whole cow's milk.* This has its place in certain conditions, but should not be attempted without the advice of a doctor.

¹ Scott's Emulsion is a reputable brand.

(3) *Dried milks.* Since the last edition of this book, dried milks have been much improved and especially for India have many advantages over fresh cow's milk.

The advantages are that the milk, provided it is properly prepared, is pure and uncontaminated. Should there be any travelling to be done with the baby, it makes feeding safe and convenient. In the preparation of dried milk the curd is modified and rendered more digestible. The composition is absolutely constant.

The only disadvantage is that in the preparation of milk powder the vitamins are destroyed, but we have already seen that these must be added to ordinary milk, after boiling.

There are many brands of dried milk on the market and it is only possible to mention a few which will be found useful. For full cream milks, such as Cow and Gate, Glaxo, Truefood, Ambrosia Lacta, Milkal. One heaped teaspoonful or one measure (sold in the tin by the makers) to one ounce of water will re-constitute one ounce of cow's milk. This can be modified and used in the same way as cow's milk, but there are alternative useful and simple rules for feeding baby which will be dealt with under the quantity and frequency of the feeds.

The best milk in the Tropics is one that is not so rich in fat as ordinary milk, since in hot weather the baby may find it difficult to utilise a full amount of fat. The Cow and Gate Export type of milk is advisable, as it is not so rich in fat as the full cream milk.

In some cases $\frac{1}{2}$ cream dried milks are found advisable for the first 2 months of the baby's life. Condensed milks of the sweet variety are not to be recommended for infant feeding, but the unsweetened varieties may on occasion be useful. Ideal Brand Milk is a good representative of this class. Malted foods, such as Mellins Food and Horlicks Milk, should not be used until the infants are six months old, as young babies are unable to digest starches and convert them into sugars. They are however useful in certain instances when babies on reaching the above age cease to thrive. The introduction of a little starch into the diet may make them gain weight rapidly.

(5) *The milk of other animals.* These milks are not to be recommended, the only practicable milk being that of the goat. There is some evidence that on occasions, goat's milk produces anæmia when fed to infants. The junior author has seen two cases of very severe anæmia in infants fed on this form of milk, which improved rapidly when cow's milk was substituted.

B. THE QUANTITY AND FREQUENCY OF THE FEEDS

There are two important rules to be observed in the feeding of children :

(a) Feed regularly.

(b) Don't feed at night.

The interval between the feeds in a healthy baby should be three-hourly for the first four months and thereafter four-hourly.

The times of the feeds should be 6 A.M., 9 A.M., 12 NOON, 3 P.M., 6 P.M., 10 P.M. When four-hourly feeds are introduced: 6 A.M., 10 A.M., 2 P.M., 6 P.M., 10 P.M. In the night the healthy child may be given boiled water *ad lib*, but never fed.

The Calculation of the Food Requirements in Infants.—In order to arrive at this it is necessary to weigh the baby. I would here like to emphasise the essential necessity of a weighing machine in the nursery. The only method by which the doctor and the mother may know that baby is thriving is by means of his weight. Baby should double his weight in five months and should gain approximately 6 ozs. a week. A weight table is appended as a guide :

At birth . . .	7½ lbs.	} Girl children may be slightly less than these figures.
At 2 months . . .	10½ „	
At 5 months . . .	15 „	
At 8 months . . .	16 „	
At 10 months . . .	18 „	
At year . . .	21 „	

With these preliminary considerations it is now possible to proceed to our Calculations.¹ Two methods will be given :

*The first method.*¹ A baby requires 2½ ozs. of total fluid, per lb. of body weight per 24 hours, this being the amount of breast milk imbibed by a normal baby.

Cow's milk. It will be found that a baby requires 1½ ozs. of cow's milk per pound per day. Therefore a 10 lb. baby requires 15 ozs. of milk in the 24 hours, but it requires a total of 2½ ounces of fluid per lb. of weight per 24 hours: it therefore requires 25 ounces of fluid. This means that 10 ozs. of water must be added to 15 ozs. of milk, giving 25 ozs. of the mixture

¹ Donald Paterson and Ruth Darby "A Study in Infant Feeding", *Lancet*, Jan. 31, 1925, p. 232.

for use. This has to be fed three-hourly giving roughly 4 ozs. of the mixture for the feed.

Sugar must be added in the quantity of one level teaspoonful for each of the infant's pounds in the 24 hours, so in the above example 10 level teaspoonfuls can be added to the 25 ozs. of the mixture, the resulting feed being sufficient for the 24 hours. It will be observed that no fat has been added to the above, but half a teaspoonful of the Cod Liver Oil Emulsion (Prescription 47) should be given three times a day except in very hot weather when two such doses may be substituted, *Ostelin* 2 drops three times a day may be used instead, as well as the orange juice. To summarise, for a baby of 10 lbs. the following would be its feed for the day :

Cow's milk	. . . . .	15 ozs.
Sugar	. . . . .	10 level teaspoonfuls,
Water	. . . . .	10 ozs.

Approximately 4 ozs. a feed every 3 hours from 6 A.M. to 10 P.M. The last feed being four hourly to lessen the night interval. One-half teaspoonful of Cod Liver Oil Emulsion three times a day. The juice of one-half orange diluted with equal parts of water twice a day and sweetened with a little sugar.

For dried milks. $1\frac{1}{2}$ measures of the powder is required per pound of body weight. Take our 10 pound baby again : 15 measures of the powder would be required for the 24 hours and 25 ozs. of water, the sugar would be added in the same proportion of one level teaspoonful per pound of body weight for the 24 hours, and the following is the required mixture for a baby of this weight :

15 measures of dried milk.
10 level teaspoons of Dextrimaltose or sugar.
25 ozs. of water.

Approximately 4 ozs. a feed every 3 hours from 6 A.M. to 10 P.M.

One-half teaspoonful of Cod Liver Oil Emulsion three times a day. The juice of half an orange diluted with equal quantity of water twice a day. Water should of course be given freely in between the feeds.

*The second method.*¹ It will be seen that this method only approximates to the humanizing method given at the beginning

¹ An excellent small book for the mother to possess is one called "Feeding and Care of Baby" by Dr. Truby King, published by Macmillan & Co.

of the Chapter—the milk being less diluted. So the following table is appended for use should it be found more simple :

WHAT QUANTITY TO FEED THE CHILD WITH AT ONE TIME

Age	Interval	No. of meals	Amount in each meal	Total in 24 hours
3rd day	3 hours	7	1 ounce	7 ounces
7th day	3 hours	7	2 ounces	14 ounces
End of 2nd week	3 hours	6	3 ounces	18 ounces
In 2nd month	3 hours	6	4 ounces	24 ounces
In 3rd month	3 hours	6	4 to 4½ ounces	26 ounces
In 6th month	3 hours	6	5 to 6 ounces	33 ounces
In 8th month	4 hours	5	7 to 8 ounces	38 ounces
9 months	4 hours	5	8 ounces	40 ounces

(All increases should be made gradually, $\frac{1}{2}$ ounce at a time.)

Mixed feeding. This can be begun with advantage about the 6th month. The baby at the time will be having four-hourly feeds, at 6 A.M., 10 A.M., 2 P.M., 6 P.M., 10 P.M. The first addition should be one ounce of bone and vegetable broth (p. 604) to the 2 P.M. feed. At 7 months the broth may be thickened with potato. At 8 months give soogie or groats—3 ounces made with milk, at the 10 A.M. feed : this may be fed with a spoon. At 9 months give three ounces of some starchy preparation, at the 6 P.M. feed, namely Mellins Food, Robbs Biscuits soaked, Horlicks Malted milk, Glaxo's Malted milk, Allenbury's No. 3 diet. This should be fed by a spoon. At 10 months add half the yolk of an egg to the 10 A.M. feed.

To sum up : at 10 months the baby would be having the following diet :

- 6 Cup of the modified milk : approximately $7\frac{1}{2}$ ounces and one rusk.
- 10 3 Ounces of Groats made with the modified milk $7\frac{1}{2}$ ozs. in all ; three teaspoonfuls of lightly cooked egg yolk ; orange juice.
- 2 3 Ounces of broth (bone and vegetable) ; a cup of the milk.
- 6 3 ounces of Mellins Food made up to 7 ounces with the milk ; orange juice ; one rusk.
- 10 One cup of the milk $7\frac{1}{2}$ ounces.

Total modified milk used in the day should be approximately 40 ounces. Rusks may be started as soon as the first teeth appear.

When the child reaches one to two years of age the following diet is a sample of what should be given. Whole milk can usually be used after one year, and at this time it is as well to accustom the child to cow's milk, substituting it for dried milk.

On waking: The juice of half an orange diluted with equal quantities of water sweetened. One rusk.

Breakfast: Groats (Robinson's Patent) Rusks soaked in milk; soft boiled egg: after 16 months, steamed and pounded fish and chicken, 8 ounces of milk.

Dinner: Milk, gravy and bread crumbs, leading on to brain to fish, irish stew, chicken—all steamed or boiled. Steamed and sieved vegetables, mashed potatoes, milk pudding, stewed fruit (in the early months of the period, the juice or pulp is best given), custard, water to drink.

Tea supper: Rusk and milk, later honey, jelly, mashed well ripened bananas. Small pieces of plain cake without currants. 8 ounces of milk in all.

6-15 P.M. Small cup of milk.

The articles should be introduced slowly from the preceding diet and not all given at once, but by two years all the above food stuffs should enter into the child's dietary.

After this time, a few general principles will be given about the feeding of children. (1) *Regularity*. This must be absolute, as in all other activities of the child's day there must be unalterable routine. (2) *No food or sweets between meals*. (3) Certain articles are obviously too rich for a child's digestion, amongst which are pork, game, salmon, tinned fish, re-cooked foods, and all shell-fish. More important owing to children's natural likes are pastries, heavy fruit cakes, hot scones, hot buttered toast, hot rich fries of various kinds. On the whole fried foods are not suitable for children under 10. In India it is particularly important to avoid curries of all kinds, to which I would add mustard, spices, and pickles. New bread is never to be given, and in India hard pulled toast is the most suitable form of bread, as it enables the child to use his teeth vigorously.

With regard to sweets, a child requires more sugar than an adult and his "sweet tooth" is the natural expression of this, but children even more than adults are apt to overindulge their natural appetites, and a routine of a couple of boiled sweets after the middle day meal is what should be allowed.

Raw vegetables such as celery, Russian salad should also be forbidden.

Having detailed a list of things forbidden, I would like to emphasise the fact that to some extent a reasonable amount of latitude must be allowed to a child's likes and dislikes. He should not be forced to eat a plate of stinky cabbage until he retches, nor should he be made to finish a large helping when he has obviously had enough. The limits of a child's diet cannot be laid down in a book, but a wise parent will appreciate the fact that while John's refusal of some article of diet is pure naughtiness, Jimmy may behave in the same way from genuine disgust.

Salt should be placed on the plate, but the use of it must be left entirely to the discretion of the child.

(4) Occasional "breakings out" at Xmas and birthday parties should not in the healthy child be frowned on: we all like to break away sometimes, and the child's natural capacity to vomit is usually sufficient to correct these departures, that are after all merely the forerunners of similar occasional indulgences in later life.

We are decidedly of the opinion that no children under the age of $3\frac{1}{2}$ should be taken to parties. Psychologically the child does not develop social instincts till that age and therefore will not miss the pleasure, and will avoid the danger of catching disease and of a temporary upset to its young

CHAPTER XVII

DISEASES OF CHILDREN

Introductory : Bronchitis : Broncho-pneumonia : Chorea .
 Constipation : Convulsions : Croup : Diarrhoea : Fever :
 Indigestion : Infantile Paralysis : Night Terrors : Rickets :
 Rupture : Infantile Scurvy : Teething : Thrush : Vomiting :
 Wasting : Wetting the Bed.

Introductory. There are certain general principles that are of importance for keeping children healthy. I would emphasise the need for routine, absolute and unvaried, in the bringing up of children. There is nothing so liable to make a child nervy and unmanageable as its being allowed to do exactly as it likes. A routine life may be looked upon as a sedative to the child's nervous system. The foregoing remarks are relevant to India where frequently children are indulged by Indian *ayahs* and servants and they may even be allowed to bully and order them about in a quite untrained manner. Such habits are bound to lead to a peck of troubles both proximate and remote.

Weight. The weight of a child is generally an excellent guide to its healthy and proper development. There are large individual variations, but at the same time a steady increase gives a rough indication of progress. A table of average weights of European children for particular ages is attached.

TABLE OF EUROPEAN CHILDREN'S WEIGHTS IN LBS.

Age	Boys	Girls
Birth	7½	7
6 Months	16	15½
1 Year	21	20
2 Years	27	26
3 Years	31	30
4 Years	35	34
5 Years	41	40
6 Years	45	44
7 Years	50	48
8 Years	55	53

Modified from "Sick Children"—Donald Paterson by kind permission.

Rest. Children should have long hours of sleep and from infancy to 10 years old the periods of sleep should vary from 18 to 10 hours in the twentyfour. Children should be made to lie down and rest or sleep after tiffin for at least two hours. In India it is important to accustom the child to sleep under a mosquito net, and there are few parts of the country where this precaution could be dispensed with safety. It will be remembered that mosquitoes are responsible for Malaria, Dengue, Filariasis and possibly other short fevers.

Feeding of Children was dealt with in the last chapter, but I should add here that scrupulous attention to the cleanliness of food is an essential. The proper boiling of milk and water, the protection of food from flies and attention to the health of servants and retainers are most important prophylactic measures against disease. It is well to remember that what may be a mild attack of diarrhoea in an adult may become a serious and even fatal illness in a child.

Exercise and Air. These are essential to the well-being of children and from the earliest age they should be out morning and evening even in hot weather, while when in the Hills, both may be indulged in freely. The hours of afternoon rest should be strictly adhered to and a child should be kept quiet for half to one hour after meals.

Lessons. These should be commenced at 5 to 6 years, while prior to that an hour or two should be set aside for games of the instructive kindergarten type, simple music, nursery rhymes, &c.

Society. The society of other children is quite unnecessary until the child reaches the age of 3½. Up to this time the child is egocentric and anything it says or does relates to itself. Parties for small children of 2 years or so upset their nerves and their digestion, while the party is mainly enjoyed by the attendant adults.

Many of the diseases to which children are liable have already been described and will be found in other chapters. Thus the infectious fevers which are most common in childhood, will be found in Chapter IV; diseases of the skin, even though they affect children more than adults, are all in Chapter X; and the disease of childhood called Adenoids will be found in Chapter XII. The present chapter contains accounts of diseases which are either peculiar to childhood or which show marked differences when occurring in children to

what they do in the adult. Page 480 should be read again here.

Acidosis. See vomiting.

Anæmia. This condition has already been dealt with in Chapter VI but recent discoveries have now emphasised its importance in infancy, that it is necessary to say something further in this chapter. An infant is born into the world with a small supply of iron, just sufficient to last it for the first nine months of its life. Milk of all kinds is singularly poor in iron, so the child has no chance in the early days of its life of obtaining a supply from the outside. If a child is exclusively fed on milk for periods beyond nine months or if the child becomes overweight, there is apt to be a shortage of iron either relative or absolute. This shortage of iron produces anæmia. The child becomes pale and is prone to attacks of bronchitis and other respiratory diseases and in general tends to pick up any infection that it may be brought in contact with. These cases simply require the administration of iron. Prescription No. 76 is suitable. Some authorities go so far as to say that there are few infants who do not benefit from small doses of iron.

Bronchitis. Acute bronchitis in children occurs as a direct extension from a "cold" in the upper respiratory passages or else as a complication of one of the acute fevers, such as measles, the latter diseases have already been dealt with in Chapter V. The effect on Infantile Anæmia has been dealt with under that heading.

The prevention and early treatment of "colds" in infancy and childhood is most important, as it prevents the development of bronchitis and broncho-pneumonia. The child should be isolated from any member of the household who has developed a cold, a point which is not sufficiently realised. Plenty of open air will also help to keep the child free from respiratory diseases.

In older children, mouth breathing will have to be corrected and medical advice as to the removal of tonsils and adenoids sought. When an infant develops a cold the symptoms are much the same as in adult: a watery discharge occurs from the nose and the child snuffles. The throat will probably be found redder than normal. When this occurs the following measures may be adopted: (1) The nose should be gently and frequently wiped with cotton wool, a little vaseline applied round the nostrils to prevent soreness. (2) A few drops of

the following medicine should be instilled into either nostril after warming :

Soft white paraffin . . . 1 part

Liquid paraffin . . . 3 parts

The procedure can be repeated several times a day. The child should be kept in bed if under 4 years of age or at any age if there is fever present.

If the condition progress to bronchitis, fever and restlessness become more pronounced, while the commencing implication of the bronchial tubes is denoted by a short dry cough.

With increase of fever the cough becomes more noisy, frequent and painful, and the breathing quick and wheezing. The breathing is performed chiefly by the muscles of the abdomen instead of the chest, which may be seen, or felt, moving much more forcibly than in a state of health. The child feels as if the chest were stuffed, and wheezing breath may be both heard and felt on one or both sides when the ear, or hand, is placed on the chest. When the breathing is very difficult, and particularly during the paroxysms of coughing, the veins of the forehead and neck stand prominently out, and the face is flushed. The fever and cough are generally worse at night, and the child is therefore more irritable and restless at that time. But it will often sleep for several hours, until reaccumulation of phlegm wakens the patient and causes a paroxysm of suffocative cough. The expectoration, if coughed up, is white and glairy. But often the phlegm secreted by the inflamed bronchial tubes is only coughed into the mouth, when it is swallowed by the child, who cannot understand the desirability of spitting the phlegm out. Often the fits of coughing cause vomiting, which sometimes much relieves the child, by clearing the throat and entrance to the windpipe, and to some extent (from the pressure exerted by the act of vomiting) the bronchial tubes also, of accumulated mucus and thus allows easier respiration. Although the skin is feverish and warm, it remains moist. The mouth and tongue, although warm, are also moist. There is no appetite, but always thirst. If the disease grows worse it tends to drift into broncho-pneumonia, and then the paroxysms of cough become more frequent, until the child has no strength left to cough. Then the face becomes pale, while the lips grow livid and parted, the nostrils dilate with each inspiration, and the breathing is more hurried and difficult and a grunting sound in the expiratory phase of respiration is often heard. Con-

vulsions sometimes precede a fatal termination, but generally death takes place without much suffering, the child passing gradually into an unconscious state. Favourable symptoms are : lowering of the pulse, diminution of the heat of the skin, less difficulty of breathing, cessation of wheezing, lengthened periods of sound sleep, and return of appetite.

The cause of bronchitis in children is usually cold, especially when the air is damp and foggy. Sometimes a smoky fire will be the irritant that causes an attack, and mild bronchitis may arise during the irritation of teething. Bronchitis is especially common with and after measles and whooping-cough. Children with diarrhoea or other signs of indigestion are liable to bronchitis more than others ; so also are those with adenoids.

There is not as a rule much danger about bronchitis itself, it is the liability of the catarrh to extend further down the tubes and produce broncho-pneumonia (see the next section) that makes the disease a serious one.

Treatment. When the approach of the malady is feared the child should be kept in the house, and the temperature of the apartment should be maintained as equable as possible both by day and night. The great importance of an equable temperature, whatever that temperature may be, cannot be too much insisted upon. In a cold climate the proper temperature of the sick-chamber would be 65° F. but in India it must necessarily be much higher. But, in any case, it should be maintained equable, and the patient should be guarded against draughts and cold. It is also advisable to moisten the atmosphere of the room by means of a bronchitis kettle, as described on p. 584 if the atmosphere is unduly dry. In climates such as Madras where the humidity is high the bronchitis kettle is not indicated. If compound tincture of benzoin be added to the water in the kettle, 1 drachm to the pint, should be the strength used. In the early stage of bronchitis, before the phlegm is loose, give Prescription No. 72, 1 drachm every 4 hours to a child a year old ; double that dose to one of four years. If the child is younger or is very weak omit the compound tincture of camphos from this prescription. When the cough becomes loose, change the medicine to Prescription No. 75, in the same doses. If this medicine produces diarrhoea, omit the ammonium carbonate from the prescription. If the bronchitis is at all severe at this stage a little brandy or whisky is advisable ; 10 minims every three hours for a child of one year. In the

cold weather or the hills the child's chest may be rubbed night and morning with equal parts of Camphorated Liniment and Olive Oil, and the chest covered with a light layer of wool, pinned on to the clothes, alternatively antiphlogistine may be used as follows: Heat the tin in a saucepan of water until the contents melt, then spread on a piece of lint cut to the shape of a jacket, feel with the back of the hand and if the temperature can be easily borne apply to the chest. No bandages should be used. The jacket should be changed twice in the 24 hours. The diet should consist of milk. Solid food is not to be given; neither will the child care for it so long as there is fever. Throughout the illness, the patient should lie with the head rather high, and be encouraged to cough frequently; not being allowed to sleep too long lest dangerous accumulation should occur. When all severe symptoms have subsided, the patient may return gradually to his usual diet. For some time afterwards care should be taken that the patient is not exposed to cold, as he will remain very susceptible to any influence affecting the chest.

During convalescence Prescription No. 73 may be taken with advantage.

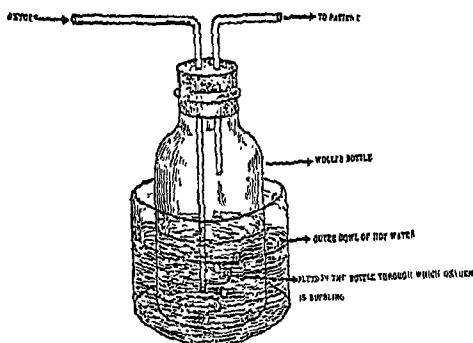
Broncho-pneumonia. The section on bronchitis in children should be read first, and from this it will be understood that broncho-pneumonia is an extension of the same catarrh further down the small tubes to the lung cells themselves. The same causes operate therefore for broncho-pneumonia as for bronchitis, the symptoms are similar but more exaggerated, and the treatment is on the same lines. Broncho-pneumonia is very common in infants up to the age of two years, and frequently accompanies measles, whooping-cough, and diarrhoea. Most of the cases of pneumonia in small children are really broncho-pneumonia. The attack begins with bronchitis as already described, and then the symptoms become more severe, the restlessness is greater, the breathing is more rapid and obstructed, and the sides of the nose can be seen working with each breath. The lips become blue, and the temperature is usually higher than in bronchitis. The fever may last several weeks and then gradually subsides. But if the child grows worse, he usually becomes drowsy and at length dies of exhaustion. Broncho-pneumonia is a very serious disease, and amongst small infants quite half those attacked succumb.

Treatment should be as already laid down for bronchitis.

The room should be warm and equable in temperature. The child has got to fight for what air it can get to its lungs, so do not allow relatives and others to crowd into the room and use up what air there is. Use the bronchitis kettle (p. 584). If the weather is not too hot, a jacket poultice (p. 500), hot turpentine stupe or antiphlogistine should be applied to the chest; but particular care must be taken both not to scald the child's skin and not to allow him to catch a chill while the heat is being applied or removed. In the early stages give Prescription No. 75, 1 drachm every three hours, to a child of a year old. If the child gets blue about the lips and face, two or three leeches (see p. 594) should be applied over the lower part of the breast-bone. After that benefit may be obtained from tincture of digitalis, 1 minim every two hours in a little water, in cases of exhaustion. The diet must consist of milk only, and alcoholic stimulants will be necessary. Either whisky or brandy, 10 minims every four hours for a child a year old or under, and double that dose for ages up to five years, should be given.

Oxygen, in these cases, is a life saving measure and it is worth sending for it at once to the nearest dispensary or hospital even should it take 24 hours to come. In the hills the mortality of pneumonia rapidly increases if oxygen is not given. Should it be possible to obtain the gas the following is the method for administering it:

- Things required :—1. Soft rubber catheter of small size.
 2. Wolff's bottle.
 3. Rubber tubing and a small piece of glass tubing.
 4. Oxygen cylinder.



The oxygen cylinder has two valves, one the main valve opened by a key and a smaller valve by which the flow of the gas can be regulated. The rubber tube is attached to the nozzle and led to the tube of the Wolff's bottle which dips below the fluid, the gas is then led from the bottle to the catheter to which it is connected by a glass tube. This apparatus can be sent with the oxygen cylinder and should be asked for. The tube is greased with a little vaseline and inserted backwards into the child's nose for about $1\frac{1}{2}$ inches. The catheter is then attached to the child's cheek with a piece of sticking plaster.

The gas should be allowed to bubble through the water at rates between 60—120 bubbles a minute. It is most important that the fluid in the bottle be kept warm, this may be done by standing the bottle in a pan of hot water.

Chorea. See Rheumatism.

Constipation. Constipation in infants may be due to the following causes :

1. Errors in quantity or quality of the diet.
2. Deficiency of fluids.
3. Errors of habit.
4. Pain.
5. Rare congenital causes.

ERRORS IN THE QUALITY OF THE DIET. If the diet contains too much protein, *i.e.*, milk, curd, constipation occurs, while too much fat and sugar will bring about diarrhoea.

ERRORS IN THE QUANTITY OF THE DIET. In breast fed children, constipation may mean that the milk supply is becoming inadequate: starvation invariably brings about constipation. On the other hand, children that are overfed and become overweight are flabby and frequently anæmic. The general lack of muscular tone in these children will bring about constipation.

DEFICIENCY OF FLUID INTAKE. It is essential for small babies to be given plenty of water in addition to their feeds; this is especially necessary in hot weather, as the child loses much fluid by sweat and a loss of fluid over intake causes constipation.

ERRORS IN HABIT. A child from its earliest days should be trained to use the chamber pot. From the earliest days the child should be sat down twice a day, after breakfast and tea. Towards the end of the first year, this habit should be

well established, and defæcation should occur regularly at these times.

PAIN. In rare instances children are unwilling to pass their motion on account of pain. This is nearly always due to a small fissure at the edge of the anus through soreness and excoriation of parts may have the same effect.

RARE CONGENITAL CAUSES. This cause is outside the scope of this book.

MANAGEMENT OF CONSTIPATION IN INFANTS. From the above headings it will be seen that constipation should be corrected according to its causation. The addition of 1—3 teaspoons of brown sugar, Mellins Food, or Meads Dextrimaltose may be sufficient to produce adequate motions. Sometimes the addition of Barley water (see p. 603) as a diluent for the milk or addition of 2 or 3 teaspoons of cream during the day will have the desired effect. If the child is on the breast, an attempt should be made to find out whether the child is receiving adequate quantities of breast milk. This may be done by weighing the child before and after each feed during the day, remembering that approximately $2\frac{1}{2}$ oz. is required per lb. of body weight for the 24 hours. Should the milk be found deficient, it will be necessary to supplement the breast feeds by the requisite quantity of milk mixture at those feeds at which the baby is not deriving sufficient nourishment. Water should be given freely to the baby: this is especially necessary for the hot weather. Errors of habit should be corrected, as regularity of the bowels is very largely a matter of habit. A little assistance by inserting a vaseline finger in the anus may help to establish the habit in the child's mind should difficulty be experienced. The child should never be allowed to go to sleep on the chamber or to leave toys to play with at that time.

DRUGS. Castor oil is absolutely contraindicated in constipation. There is no more certain way to make the child constipated than by administering this popular remedy. I would recommend the following list of aperients in the case of infants:

1. Petrolagar 1 to 2 drachms every evening, or alternatively liquid paraffin, given in the same doses. These aperients may be used regularly if necessary for months on end.
2. Grey powder, $\frac{1}{2}$ to 1 gr. at night, followed by Milk of Magnesia 1 to 2 drachms in the morning, or alter-

natively, Enos Fruit Salt at the same time. Grey powder should be used as an occasional aperient and should always be followed by Saline in the morning. Milk of Magnesia is a mild and excellent aperient and may be used freely in constipation in infants. The best brand is Phillip's Milk of Magnesia, which is easily obtained at any chemist's.

In younger children, fruit of various kinds, such as prunes, &c. are not in the opinion of the author advisable.

CONSTIPATION IN OLDER CHILDREN. In these children error of habit is by far the most important cause of habitual constipation; either the habit was not established in infancy or it has been allowed to lapse as the child grows older. In some children undue fussiness about the natural functions on the part of the parents affects the child's mind and it develops an excessive anxiety about its bowels. This anxiety invariably leads to an inability to defæcate. The management of these cases is obvious. The child should be made to try daily after breakfast whether successful or not. One of the mild aperients mentioned above may be administered to assist and encourage the child. Above all no anxiety should be expressed by the attendants as to the result of the morning's session. Extra fruit on waking in the morning may assist the child to defæcate. A glass of cold water on waking is also often effective. The best fruit for this purpose are stewed prunes, stewed figs, and a raw apple. In older children, besides the drugs mentioned under the heading of infants, the following medicines will be found useful. 1. The old-fashioned Syrup of Figs 1—4 teaspoons at bed time. 2. Alternatively, a dose of mixture No. 77 at bed time may be used. This medicine may be used in gradually decreasing quantities and finally omitted.

N.B.—Should constipation in a child be acute in onset and occur in conjunction with severe abdominal pain, vomiting, rise of temperature, or alternatively, collapse, every effort should be made to obtain medical assistance. Hot stupes to the abdomen may be applied and all food other than sips of water by mouth should be withheld. In such cases, do not give an aperient without medical advice.

Convulsions. Convulsions in children may be either of one part of the body only or of the whole body. Thus of the former kind are a spasm of the throat, called sometimes spasmodic croup, or by doctors laryngismus, or a peculiar spasm of the hands and feet called tetany, or a mere twitching of some part of the

body, a hand perhaps, or part of the face. A general convulsion is usually something more evident and amounts to an actual fit, which may be indistinguishable from an epileptic fit in the adult. It will be readily understood how some of the lesser convulsions of parts of the body may easily pass unnoticed by the parent: even a general convulsion may not be recognised, since it may consist of but a temporary loss of consciousness or a mere starting during sleep. Yet it is important to recognise these mild convulsions, since they may develop into the more serious kind, and at this early stage they are more amenable to treatment. Besides, the best treatment of convulsions consists in their prevention, and that can only be done if the milder convulsions are recognised as warnings. Infants of only a few days old may have convulsions: they may twitch their limbs and roll their eyes; such children are usually very drowsy. Infants of a few weeks old may have convulsions suddenly. These are usually due to indigestion and give warning that the food should be attended to (see Chaps. XV, XVI.)

But convulsions are commonest in children of eight months and upwards: both general convulsions of the whole body and those of parts of the body already mentioned. There is no essential difference between a general convulsion in a child and an epileptic fit. An attack of general convulsions presents spasmodic contractions of the arms and legs, which are suddenly rendered tense and hard, and are drawn upwards and inwards towards the body; the eyes are also turned up under the lids, the mouth perhaps screwed to one side, while the teeth grate, the lips twitch, and froth appears at the mouth. The head and neck may be drawn backwards, or to one side, and the throat may be affected as in spasmodic croup. Sometimes the convulsions are limited to one side of the body. During the fit the urine and fæces may be discharged involuntarily, and a clammy moisture breaks out over the whole body. The pulse is weak and often irregular, the breathing laboured, and the pupils of the eyes will be found either contracted or dilated, but always insensible to light. This condition may last for a few minutes, or may endure, with intervals of remission, for hours, the child being more or less insensible during the whole period. At last the child falls asleep or cries loudly, or lies in a kind of stupor, slowly returning to consciousness or becoming profoundly insensible. Rarely in bad attacks it may die from spasmodic closure of the air-passages, the face

becoming purple. The head is thrown back, violent efforts are made to breathe, and a crowing noise like that of croup is heard, which gradually becomes fainter as the child sinks.

Of the convulsions that affect part of the body only spasmodic croup is the most important, and is described separately on p. 507.

The principal predisposing cause of convulsions is an inherited neurotic tendency. Children who suffer from convulsions in infancy are more likely to suffer from epilepsy in after-life; the same neurotic tendency is at the back of that condition also. That is also a reason why we should try to cure convulsions in infancy, as their increased frequency tends to habit, and that in its turn encourages the onset of true epilepsy.

Apart from the neurotic tendency the most important predisposing cause of convulsions is rickets, so that in any child with convulsions, rickets must be searched for and a diet arranged that will contain sufficient fat (see p. 576). In some there is a local irritant cause such as teething, worms, indigestion, the excitement of anger or other emotion, or the onset of a fever. Constipation is by no means an uncommon cause of convulsions, and this factor as well as the others just mentioned must be considered in treating each case.

The *treatment* of convulsions may be considered under two heads, one for when a convulsion is actually occurring, the other for the period in between the fits. When a convulsion occurs, the whole child, except the head, should be immersed in a hot bath 101° F.; a mustard bath is better still if one can be speedily obtained (see p. 581). Then some of the chloral and bromide draught (Prescription No. 29) should be injected by means of a small syringe into the child's rectum. A suitable dose is 1 drachm for a child of three months, which may be repeated in three hours if necessary; for a child of one year double that dose is suitable. This will usually be found most efficacious. When the child has recovered he should be taken to a physician to determine so far as possible the cause of the convulsions and to act accordingly. Remember to avoid constipation; and as rickets is so common an association, it will be found that 1 or 2 grains of potassium bromide in 1 drachm of Prescription No. 47 thrice daily is often beneficial. The possibility of some local irritation, as teething or worms, exciting the convulsion is also to be remembered. Lancing the gums was formerly a common treatment for convulsions; it is,

however, only indicated if there is a tooth nearly through that is causing redness and swelling of the gum. All possible causes of local irritation should be removed from any child, especially a nervous one; for instance, a long and tight foreskin in a male child may require removal for this reason.

Croup. The word 'croup' is very loosely used, and has a somewhat different meaning to the lay public and to the medical profession. The former use the word to express any crowing sound in a baby's throat, especially if it comes on suddenly and is accompanied by cough. The medical profession are avoiding the term 'croup' as much as possible, since it has been used even amongst themselves to express conditions widely different from one another. For instance, *membranous croup* is diphtheria nearly always, and the reader is referred to p. 47 for an account of that condition. *Inflammatory or catarrhal croup* is acute laryngitis occurring in children, an account of which will be found on p. 433. A third variety is called *spasmodic croup* or laryngismus stridulus, and occurs in neurotic and rickety children, usually in hand-fed children during the first year of their life.

The affection designated *spasmodic croup* is a form of the convulsions of children. It is popularly known as 'child-crowing.' Infants in poor health often wake up in the night with a start and for some time cannot get their breath—a condition designated by nurses 'a catch in the breath,' but which is in reality a minor degree of spasmodic croup. When fully developed the principal symptom of spasmodic croup is a remarkable *crowing* inspiration, unattended with cough, and coming on suddenly, often on first waking from sleep. For a minute or so the child makes ineffectual efforts to draw breath, and struggles violently, but at length the difficulty is overcome and breath is *drawn in* with a loud crowing sound. The difficulty of breathing is during inspiration, and in the intervals between the paroxysms the difficulty ceases, which does not happen in other forms of croup. Of these attacks there may be several during the day or night. In extreme cases the face becomes livid, the whites of the eyes bloodshot, the thumbs are clenched in the hands, the fingers and toes are bent, and the joints of the wrists and ankles are forcibly turned inwards, and very violent attempts are made to breathe. Occasionally death results from suffocation or exhaustion, but the malady is not so dangerous as inflammatory croup. The spasmodic tendency of the parts about the throat sometimes excites a

peculiar condition, in which the child is able to swallow solids with ease, but chokes when it tries to drink fluids.

Spasmodic croup depends on spasmodic or convulsive action of the muscles about the upper part of the windpipe. It is distinguished from other forms of croup by the very sudden accession and decline of the fits or paroxysms, and by the perfect freedom of the breathing in the intervals. Also, by the absence of fever or catarrhal symptoms, and generally by the absence of cough. As laryngismus stridulus is of the nature of convulsions a treatment similar to that described for convulsions should be adopted. During the spasm a hot sponge should be applied over the throat, and the Prescription No. 29 injected into the rectum in the doses above recommended. In the intervals of attack Prescription No. 47 administered in drachm doses thrice daily.

Diarrhoea. Diarrhoea is the commonest and most fatal of all the infant disorders. It is most common in the hot weather and rains, and especially so amongst hand-fed children. This is because the diarrhoea is usually caused by the action of micro-organisms which flourish best in warm weather and which gain access to the child's bowels through the milk. Apart from this exciting cause the commonest predisposing cause is an error of diet or indigestible food, whilst a chill or the irritation of teething are also assistant causes. An infant's bowels should act from one to four times daily, and the motions should be of the colour and consistency of mustard, and free from foul or acid odour. The diarrhoea of children is often accompanied by vomiting, and is attended with more or less flatulency, and frequently by griping, which is evidenced by the straining cry of the child, and by its legs being spasmodically raised up towards the abdomen when the pain occurs.

There are different forms of diarrhoea amongst infants: we can classify them in a simple manner as follows:

(1) **Simple Diarrhoea.** The mildest form: usually from indigestible food.

(2) **Inflammatory Diarrhoea.** There is fever, and the illness is more severe. The symptoms vary according to the part of the bowel inflamed.

(a) *The upper part of the bowel and the stomach are affected.* Vomiting accompanies the diarrhoea; no mucus evident in the stools.

(b) *Lower part of the bowel affected.* Mucus and perhaps

blood in stools, which resemble those of dysentery. Little or no vomiting.

(3) **Cholera Infantum.** This is a severe form; not true cholera, but the stools are very watery and resemble those of cholera.

(4) **Chronic Diarrhœa.** Lasting several weeks; perhaps as a sequel of one of the above.

We will now say a little more about each of these varieties and their treatment.

(1) **Simple Diarrhœa.** The child perhaps shows signs of pain and flatulence, may vomit once or twice, and be purged six or seven times in the day. There may be curds in the stools and the temperature may be raised to 101° or more for a few hours. When the stools are a natural colour, and there is no fœtor or feverishness, the diarrhœa is probably caused by an accidental error of diet, or by atmospheric vicissitude. When the stools are yellow, becoming greenish after exposure, it denotes a large secretion of bile, and the disease is still a mild one.

Since the cause is usually indigestible food, the appropriate treatment is a teaspoonful or two of castor oil to expel the offending matter. After that, drachm doses of Prescription No. 74 every three or four hours, especially if there is vomiting. If only a little looseness of the bowels, then drachm doses of Prescription No. 43 at similar intervals may be given. The diet at the same time must be lessened. Less milk must be given and it must be more dilute. If the diarrhœa is at all severe it will be well to give no milk at all for a few hours, but albumen water (*see* p. 602) instead. If neglected this variety of diarrhœa may pass on into the next and more severe form.

(2) **Inflammatory Diarrhœa.** This is what doctors call gastro-enteritis; the symptoms varying according to whether the inflammation is mostly in the stomach, gastritis, or in the bowel, enteritis. If the lower bowel alone is affected the disease may be called colitis. The disease begins often with vomiting and then the child passes loose stools, which are perhaps green and slimy and offensive. If he vomits much he soon looks exhausted, the eyes sink in, and he becomes very thirsty. He is now probably unable to keep anything down but water or a little albumen water. The temperature may rise to 102° for three or four days or it may not. When the lower bowel is more affected there tends to be less vomiting

but more prolonged fever, the belly is very tender, perhaps distended, and the child will pass partly liquid or lumpy motions with much mucus and often with streaks of blood, straining sometimes until the bowel comes down outside. Such colitis resembles dysentery, in fact many of these cases are true bacillary dysentery because they show the organism of that disease. A word of warning is here necessary; not every child painfully passing blood and mucus has colitis or dysentery. If a small sausage-shaped lump can be felt in the belly of such a child the disease is probably intussusception, and requires urgent surgical treatment.

(3) **Cholera Infantum** is not true cholera, but in the frequent and profuse watery motions it resembles that disease. Collapse is soon produced from the diarrhoea and vomiting, which is always severe. Fortunately this severe type is less common than the already-mentioned forms of diarrhoea, though there is no hard-and-fast line between this variety and that last described.

Treatment. The treatment in diarrhoea of infancy depends on certain general principles: these are:

1. To rid the intestines of the poisons causing the diarrhoea.
2. To re-place the fluids lost by the vomiting and diarrhoea.
3. To keep the child warm and administer stimulants if severe collapse occurs.
4. Careful return to the normal diet and regime of the child.
5. In case of true dysentery to administer the appropriate specific treatment, viz., anti-dysenteric serum. As this is unlikely to be available, further mention of this method will not be made.

1. This may be accomplished by

(a) Starvation—stopping all food and giving only boiled water or weak fresh tea by the mouth in unlimited quantities. This measure rests the bowel and stops the supply of pabulum necessary for the growth of micro-organisms.

(b) The administration of purgatives to clean the intestines of poisonous debris. In mild cases one teaspoon of castor oil may be sufficient or the following prescription administered in doses of 2 teaspoons every two hours for 6 doses: Sodium sulphate 20 grains, Sodium bicarbonate 5 grains, Glycerine 10 minims, caraway water to drachms. 2. After a few doses of this mixture, the stools should become more watery and brown and any greenish matter or mucus should disappear. After this has occurred the mixture may be

substituted by prescription No. 74 given 4 hourly for one day, then three times a day for one or more days.

(c) In severe cases it may be impossible to administer anything by the mouth or rectum, in which case, if the vomiting is severe or the diarrhoea incessant, washing out the stomach and the lower bowel will assist to control these symptoms to rid the alimentary tract of poisons and to administer fluids. Washing out a child's stomach can be readily done through a soft rubber catheter attached to a funnel: 2 to 4 oz. of warm water with a pinch of sodium bicarbonate may be used (*see also p. 601*).

2. To re-place the fluids that have been lost. This is a very important measure, as children are particularly sensitive to loss of fluids; the fluid may be given by mouth or in very severe cases under the skin. The baby should be encouraged to drink as much as possible of any of the following: plain boiled water, weak freshly made tea, and one pint of water to which $\frac{1}{2}$ teaspoon of common salt and a pinch of sodium bicarbonate has been added. If the vomiting is so severe as to preclude the administration of fluids by the mouth, the following measures must be adopted. Attach a hollow needle (serum size) to a piece of rubber tubing, attach the latter to a funnel and boil this apparatus for 5 minutes. Prepare a solution of common salt in water, in the proportion of 1 drachm to the pint; boil and allow it to cool. Now clean up the loose skin below the arm pits with alcohol or methylated spirits, pick up a fold of the loose skin between the finger and thumb and thrust the needle in slantwise, so that it lies in the loose tissues below the surface. Pour the solution in the funnel and allow about 2 oz. to run in; a swelling will be seen owing to the accumulation of the saline in the loose parts of the skin, but this will soon disappear as it is absorbed. The process may be repeated when the fluid has been absorbed.

3. It is very necessary to keep the child warm, and in severe cases with collapse, it is of advantage to start the treatment with a mustard bath for 15 minutes (*see Ch. XX*). Brandy in 5 drop doses may be given every 4 hours to infants who are in a state of collapse.

4. After 6 to 24 hours starvation, it will be necessary to give food. This step requires great care and the following methods are usually effective: (1) one part of skimmed milk to one part of water may be given every 4 hours alternating with feeds of (2) rice water; thus giving the baby a feed every

2 hours. The skimmed milk can be made much more digestible by the addition of 20 drops of lactic acid to $\frac{1}{2}$ pint of the milk (*see* p. 609). If this is done, the child will usually be able to take pure skimmed milk from the beginning. As the child improves, the number of feeds should be diminished, but the quantity of each feed increased until the child is being fed at the usual hours and the full quantity of milk is being taken for the age. Transition should be $\frac{1}{2}$ strength lactic acid skimmed milk to whole strength lactic acid skimmed milk, to skimmed milk without the acid, to skimmed milk and ordinary boiled milk, to boiled cow's milk, or whatever strength and type of feed the child was accustomed to before the diarrhoea. Saccharino will be found useful for sweetening the feeds during and after the attack of diarrhoea, when sugar should be added cautiously to the feeds and only after convalescence. Finally, it must be emphasised that scrupulous attention to cleanliness will prevent a recurrence of severe diarrhoea in childhood: the special point to watch being, the preparation of food, flies, and preventing the child from putting dirty things into its mouth.

Fever. What has been said about fever generally at the beginning of Chapter IV applies equally to children: it remains to add that children get fever more readily than adults on account of their less stable nervous equilibrium, and that many cases of a rise of temperature in children are due to causes that would not show themselves in that way in later life. For instance, simple constipation or, in India, a brief exposure to the sun are by no means uncommon causes of fever in children; and the general disturbance that attends teething is sometimes shown by an attack of fever. Such rises of temperature are more common in neurotic children. Sometimes at intervals of several weeks or months a child will have a few days' fever for no apparent cause; in most of these cases a digestive disturbance is at the root of the trouble, sometimes constipation. In other cases a child will have a constantly raised temperature, or sometimes he will be normal in the morning and nearly 100° F. in the evening. This state of things may go on for months without apparent cause. As already stated, the child is usually of a nervous type and may suffer from night terrors or other nervous disturbances as well. In every case of persistent or recurrent unexplained fever the child should be taken to a doctor, and a thorough examination made. There

are sometimes causes of such fever, unsuspected by parents, in the throat, ears, intestines, and even in the kidneys.

Indigestion. As in the adult, the digestive processes of the infant may be at fault either in the stomach or in the intestines, and the deficiency may be evident in many ways, as vomiting, constipation, diarrhoea, the passage of curds in the motions, or the occurrence of griping pain in the belly accompanied by gaseous distension. The first-named symptoms are dealt with separately: we will here describe the two last named, which are both of very common occurrence. And first we would remark that most of the indigestion in infants is due to improper feeding, and so the preceding chapter which deals with the feeding of children should be read before the account of the particular symptom from which the child is suffering is looked up.

A. Milk Curds in the Motions. The appearance of tiny white flecks in the motions of the infant is an extremely common occurrence, and may pass unnoticed unless the presence of diarrhoea directs attention to the motions and calls for their closer examination. These white flecks consist of casein, the protein that forms the curd of milk. Their appearance in the motion always demands attention, because it means that the child is not digesting all the milk given him. The appearance of curds, especially in very young infants, in many cases means that the cow's milk given is insufficiently diluted, and if this error is corrected according to the principles given in the last chapter the curds may disappear. But in other cases insufficient dilution is not the cause, but a natural intolerance to the curd of cow's milk; and where dilution alone with water or barley water is insufficient to cure the condition, then sodium citrate, 1 grain to the ounce of milk, should be added to the feeds, as described in Chapter XVI. This will usually be sufficient; but if the addition of sodium citrate to the milk still does not help the breaking up of the curd fine enough to enable its digestion, then it is advisable to stop all milk for the time and put the child on whey, which has no curds. The whey should be made with rennet (*see* p. 611). When the condition has been relieved by this whey diet, the addition of cream should be made in the proportion given in the last chapter, and on this whey-cream diet the child may be kept for a few weeks. A return to milk, however, should be attempted before long, making the change gradually, diluting

the milk at first with the whey-cream mixture. Sometimes instead of using whey the curds may be made to disappear from the stools by peptonising the milk (*see* p. 610), but it is not advisable to continue a diet of peptonised milk for long, and we prefer giving whey in any obstinate case.

B. Wind in the Stomach. The wind may be in the stomach itself or in the intestine. Sometimes it is evident on looking at the child's belly where the wind is, as the part distended may stand out prominently. If the gas is in the stomach there may often be vomiting and belching and hiccough, and sometimes sleeplessness. Wherever the wind is there is likely to be griping pain, called colic, and the infant may kick and scream for an hour continuously when such pain comes on. Wind is the commonest cause of griping pain in infants; other common causes are constipation and the undigested food as curds remaining in the bowel; wind often accompanies the two latter conditions. When a child screams much, look at its stools: they may show the presence of curds or of some other dietetic error. Flatulence in infants usually means an error of diet, and when it occurs the parent should consider the diet in the light of what has been said in the previous chapter and try to find out where the mistake is. It may lie in one of the following circumstances: the feeds are too large; the feeds are too frequent; the child feeds too quickly; there is too much carbohydrate, either starch or sugar in the feeds, thus it may be due to the barley-water in a small infant; the milk is not diluted enough; there is too much fat in the food.

The *treatment* therefore may lie in the rectification of any one or more of the above errors of diet; and the condition should be dealt with from consideration of its cause. Any particular attack of flatulence may be relieved at the time by the homely dill-water, a tablespoonful of which may be given either with the feed or after it. Peppermint-water is similarly efficacious; and if the wind is in the stomach itself, and especially if there is vomiting at times, bismuth is indicated, such as Prescription No. 74, 1 drachm every three or four hours. But the bismuth mixture should not be continued more than two or three days, as it tends to constipate. When the child is screaming severely relief may be given at the time by gentle friction with the palm over the child's belly, by frequently changing the child's position, sitting him up, then lying him down, and by hot fomentations

on the belly. If there is reason to think the child has taken something that disagrees with him, a teaspoonful or two of castor oil should be given on these occasions, while if constipation is the cause a small injection of glycerine and water into the rectum may remove lumpy fæces and allow wind to pass.

Infantile paralysis. Infantile paralysis is really one of the fevers, and is infective and due to the presence of a micro-organism. But the disease is more conveniently classed here, as those affected are nearly always children under three years of age, though sometimes young adults are attacked.

The seat of the disease is in the spinal cord where certain nerve cells are destroyed. As a result of this the muscles served by those nerve-cells are paralysed.

The illness may begin in various ways. Usually there is fever for four or five days, on the decline of which the child is found to be unable to move one or more limbs. Sometimes the onset is quite sudden, and sometimes again so insidiously gradual that the actual date of its beginning cannot be fixed. When the paralysis is first noticed it is at its maximum and it will tend to get better, rapidly at first and then gradually up to a period of about two months. After that there can be no improvement in the muscles paralysed, but considerable further improvement may take place during the next year or so in the training of other muscles to take on the part of those paralysed. It should, however, be understood that recovery can never be complete.

The *treatment* of infantile paralysis cannot aim at removing the cause of the disease, because nothing can repair the damaged nerve cells. Treatment must lie in massage, electrical treatment and regulated exercises of the helpless limb. The most important of these is massage, and as it will have to be done twice or thrice daily it is obvious that some one at home must do it, and therefore the mother of a paralysed child should early set about learning the art of massage. The child should be taken to a doctor at intervals for him to note progress, advise further treatment, and especially to watch for the onset of any surgical deformity, such as club-foot, which may arise as a sequel of the paralysis. Should such occur it is advisable to take the child to an orthopædic surgeon. A word of encouragement is necessary to parents whose children may be so suddenly disabled by this disease; although the disability is in a sense permanent, yet the lapse of time allows such power to developing compensating muscles that, apart from entry into

one of the public services, the useful activity of the affected one may not be lessened. Several leading public men have had infantile paralysis.

Night terrors. Older children are subject to a nervous affection called *night screaming*, or *night terrors*. They wake up suddenly, apparently horribly frightened, and commence screaming violently. While thus screaming, they are generally quite unconscious of what is occurring around them, and cannot recognise, or be comforted by, their friends, or they think some object near them is some animal coming to attack them. The screaming may last a few seconds, or it may be continued for an hour or more, and in confirmed cases the sudden waking up and screaming may be repeated several times during the night. Some of the minor symptoms of convulsions may be present, or the attack may terminate in a convulsion. The cause sometimes lies in stuffing of the nasal passages, as by adenoids, or in large tonsils. Or it may be attributable to dreams and nightmare from indigestion, or to the cold feeling arising from wetting the bed, with which it is often associated. Sometimes the cure of this latter ailment will stop the fits of night screaming. In male children circumcision will cure this condition in some cases. This affection occurs in children who are naturally neurotic. Any cause of excitement or strain to the child must be removed: it may be he is working too hard at school. Any local cause of irritation, as those already mentioned, must be attended to. For medicine Prescription No. 55 should be given in doses proportionate to the age of the child and the severity of the attack; thus a child of seven years might be given $\frac{1}{2}$ ounce of this mixture at bed-time, or even double that dose. Night terrors is akin to sleep-walking, and the same children may be subject to both. Sleep-walking in children requires similar treatment to that given for night terrors.

Rickets. Rickets is one of the commonest diseases of infants, especially common in England. It is not nearly so common in India. Probably this is because Indian children are breast-fed to a greater extent than English children, since the disease is commoner amongst the hand-fed. Moreover, many of the English children in India are of the better class whereas rickets is especially common amongst the poorer city-dwellers. It is quite possible, however, for rickets to occur amongst the breast-fed, since the disease is often not evident till the second year of life, by which time the child will have been weaned,

and if the child is then put on unsuitable diet, he is liable to get rickets. For there is no doubt that rickets is a diet disease. The particular error in the diet which leads to rickets is a deficiency of Vitamin D, a food factor which is to be found in fats. That is why rickets is so common amongst those who have been fed upon the advertised patent foods, because, as explained in Chapter XVI, the characteristic of many of these foods is an excess of starch, and most of them are deficient in fat-soluble vitamin. It is unnecessary to describe in detail the appearances of advanced rickets, the large, square, flat head, the pigeon breast, the beaded ribs, the curved legs, the rounded spine, the pot-belly, and the stunted growth; because these signs are so evident that before they are established the advice of a doctor will have been sought.

It is necessary for the mother to know rather the first signs of rickets, and first it is necessary to realise that rickets is not a disease of bones only, but of all the body tissues, and that it may show itself first elsewhere than in bony changes. Probably the first thing that attracts attention is that the child is peevish, its food appears to do no good, its sleep is disturbed and the pillow is found wet with sweat from his head. There is, perhaps, a little fever, and then sweating all over, and a tendency to kick off the clothes at night. He is late in getting his teeth, and late in learning to walk; or reluctant to walk, if he has learnt already. That is partly because the ends of the bones near the joints are swollen and tender, but also because the muscles themselves are weak. For rickets is not a very painful disease: if there is marked tenderness of the limbs, scurvy should be suspected (*see p. 221*). The thickening of the bones near the joints becomes especially evident at the wrists, where the swelling soon amounts to a deformity.

A child with these signs should be taken to a doctor.

The best *treatment* of rickets is to prevent it, and the best means of doing this is to breast-feed the child. If breast-milk is not available, the next best thing is fresh cow's milk without the addition of any starchy patent food before the age of nine months. And here again we must refer the reader to Chapter XVI. Do not use barley-water to dilute the milk. Even lime-water is not entitled to the good reputation it possesses in this disease. The administration of cod-liver oil is essential either in the form of Prescription No. 47, a teaspoon twice a day, or, better still, one of the proprietary preparations of cod-liver oil such as Ostelin, or Adoxelin.

Plenty of sunlight and fresh air is essential, and exercise in the open air if the child is old enough. Orange juice, sweetened, should be given in all cases of this disease, as there is a tendency to scurvy being associated.

Rupture, Infantile. Infants are sometimes born ruptured, or may become ruptured from natural weakness and non-closure of the parts, and straining when crying, or from costiveness, and also from the condition that requires circumcision. A rupture in infants is curable, if only proper care be taken, by means of a truss. The chief care is to see that the rupture, after the beginning of treatment, never comes down: this is met by the wearing of the truss day and night, and by taking care that, when it is changed daily for the sake of cleanliness, the nurse or mother must make pressure over the opening while a fresh truss is being applied. Two or three trusses must be in use so that a clean one is always available. A cure may be looked for within two years, often in one year. In children of five or six years of age and older, the chance of a cure by the truss is very small, and operation is called for. A figure-of-eight bandage may be substituted if well-made trusses are not available. Further, a truss may be made out of a skein of Berlin or lamb's wool of thirty-five to forty threads. This may be crocheted into a flat band about 2 inches wide, and looped at the end. After replacing the rupture, place the looped end of the skein over the seat of rupture: pass the other end round the body and through the loop, which must be carefully adjusted over the seat of rupture. Then carry the end down between the thighs, bring it up outside the thigh and fix it to the loop. A pad may be used if necessary.

Besides the rupture in the groin, a rupture may also occur at the navel. The treatment is the same as above described. As a substitute for a truss, a piece of lead, a rupee, or a cork, covered in lint, may be used to cover the weak spot after the rupture has gone back, and can be fixed in place by strips of plaster and a light flannel bandage $2\frac{1}{2}$ inches wide. The same care never to let the rupture protrude at the time of changing the truss must be taken.

Scurvy. Infantile scurvy, sometimes known as scurvy rickets, is scurvy occurring in infants. It has nothing to do with rickets except that both diseases are due to errors of diet and therefore may be associated. The disease occurs in children fed only on sterilised foods, without the compensation of fresh

meat or fruit juices. The child becomes gradually ill, loses weight and looks pale. He then comes to lie still, and is in evident pain when any movement is attempted or limb grasped. There may be swelling of part of a limb. If he has teeth the gums are swollen, and may even hide the teeth. The disease usually begins between the ages of six months and a year.

What makes the limbs tender is the bleeding deep down on the surface of the bone. When this occurs in the thighs it causes the child to lie with the thighs separated and turned outwards. Bleeding in other parts may occur, and be evident as bruises under the skin: for instance, a black eye appearing without cause should arouse suspicion. Blood may also come in the urine and make it appear 'smoky.'

As with rickets, the best *treatment* of scurvy lies in its prevention, and hence, for a hand-fed child, the addition of some fresh element into the diet is essential. If the milk is always boiled or pasteurised, the addition of orange juice, 2 teaspoons thrice daily, is essential. The treatment of an established case should be on similar lines. The outer floury portion of a boiled or steamed potato beaten up into a thin cream with milk is also valuable in treatment: 2 heaped teaspoons of potato to 1 ounce of milk: give 2 teaspoons of this cream thrice daily for two or three weeks. Handle the child as little as possible; do not bathe him; wrap him in loose clothing without sleeves and leave him undisturbed, cleaning him when necessary.

Teething or dentition. When the child is in good health, and the teeth appear naturally, they do so in the order

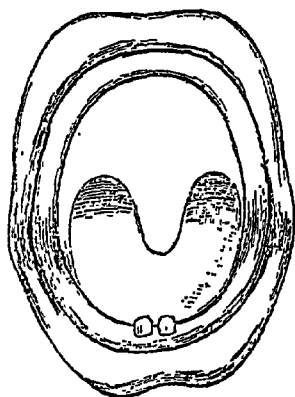


FIG. 39.

shown by the figures. The two lower central incisors, or front teeth, penetrate the gums about the seventh month (Fig. 39); the corresponding upper central incisors in from three weeks to a month afterwards (Fig. 40); the two upper lateral incisors about the eighth or ninth month (Fig. 41); the two lower lateral incisors generally a month afterwards (Fig. 42). The anterior molars or grinders of the under jaw make their appearance about the fourteenth

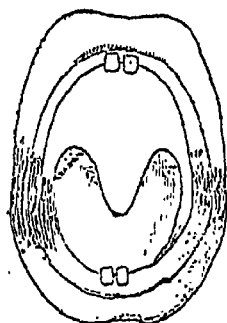


Fig. 40 8th month

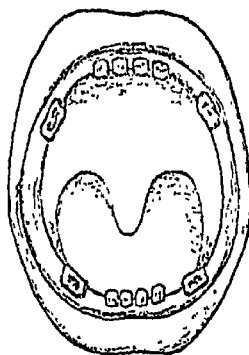


Fig. 43 14th month

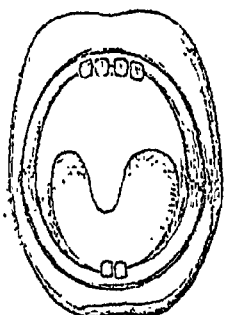


Fig. 41 9th month

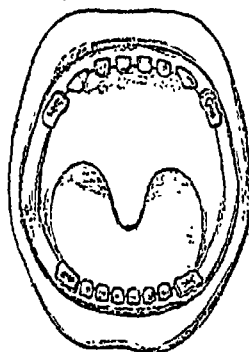


Fig. 44 18th month

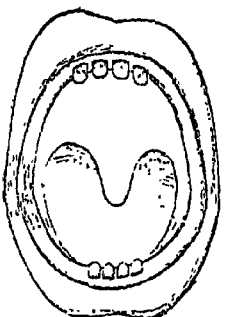


Fig. 42 10th month

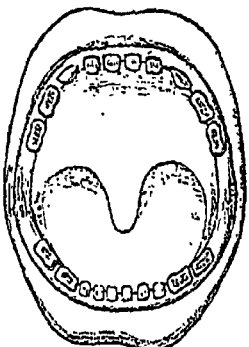


Fig. 45 2nd year

Diagram of Dentition

month, those of the upper jaw following shortly afterwards (Fig. 43). The canine or 'eye teeth' are cut between the sixteenth and twentieth months (Fig. 44). Last of all, the second molars are cut between the twentieth and thirtieth months (Fig. 45).

Thus, the cutting of the twenty temporary, or 'milk teeth', as they are called, is completed, as a general rule, at the age of two and a half to three years.

Formation of the Teeth. At birth the teeth consist of pulpy substance buried in the gums, and it is not till the fourth month that they assume shape and hardness. Infants at this period and up to two years may suffer from symptoms of teething. Teething is usually held to be the cause of many ailments, but its effect in this respect has been exaggerated. The time is one of transition: the diet is often being changed at this period. Moreover, at this time disorders of many kinds, convulsions, bronchitis, and diarrhoea may occur, and are likely to be attributed to the teething which is a visible process, when they are really due to some quite different and less evident cause. There are, however, certain minor evils undoubtedly due to teething in some children. If the process is going on naturally, there may be no symptoms at all, or perhaps a little feverishness, dribbling from the mouth, or occasional diarrhoea. The commonest complaints during teething are restlessness and feverishness at night. The child is cross, and loses colour. Do not alter the child's diet at such a time unless the occurrence of diarrhoea requires it. The child may like to have his gum rubbed, and after the age of six months a piece of hard breadcrust or a bone may be given him with advantage to gnaw and help the teeth along with.

When a tooth is near the surface, there is a prominent, shining, and sometimes white appearance of the gum, and the child, who before was pleased to have the gums rubbed, does not willingly permit them to be touched.

The Care of Children's Teeth. It is, unfortunately, a popular belief that decay of the milk teeth does not matter; and that small children need not have their temporary teeth stopped. This is a very great error. It is most important both to prevent and to remedy dental caries in childhood.

Children often bolt their food on account of toothache, and apart from that, decayed teeth may injure the health directly by the absorption of the septic matter into the circulation. The mouth of the child should, therefore, be regularly inspected,

and on the first sign of decay in any one tooth he should be taken to the dentist. Up to the age of three a child's mouth should be cleaned daily by the nurse : after that age he should be able himself to use a toothbrush under supervision. The times at which the tooth-cleaning is to take place is important. It should be done twice daily, once *after* breakfast in the morning, and again at bedtime.

After the bedtime cleansing no food on any account should be given : the good-night chocolate is a pernicious custom, because it is from the retention and decomposition of small particles of food in between the teeth that decay first sets in. A convenient tooth-powder is given in Prescription No. 71 ; some of the proprietary pastes as Kolynos or Colgate's Cream are also excellent. It is a good thing to train a child from the earliest to chew hard food : from the age of 6 little crusts or bones to gnaw are very good. The food of civilised man is so soft that the stimulus to the growth of teeth formerly given by hard chewing is now lost to a great extent : hence the advisability of some hard material for children, at each meal. It is regrettable that children are often not allowed to take their bones in their fingers to gnaw them.

As a rule, no trouble attends the appearance of any of the permanent teeth, excepting the 'wisdom' teeth. But sometimes the front teeth are too crowded, and the side teeth may grow so out of line as to irritate the mouth and require extraction.

The cutting of the 'wisdom' teeth is often attended with pain. The difficulty arises from the teeth appearing so close to the curvature or angle of the lower jaw that the mucous membrane of the mouth, where passing from the cheek to the jaw, is caught by the rising 'wisdom' tooth, and nipped every time the mouth is closed. Ulceration is produced, and a troublesome sore may result. Sometimes there is stiffness, or even closure of the jaw in consequence. The best treatment is to cut away, with a sharp pair of scissors, any overhanging fold of membrane, so that the teeth may not press upon any part of the texture of the mouth when the jaws are closed. The ulcer will then heal, particularly if touched occasionally with a camel's-hair pencil charged with strong alum water, or with vinegar.

What has been said as to the necessity for cleaning the teeth twice daily *after* meals applies equally to the permanent set, and the advice given there as to the benefits of hard food

should be borne in mind. It often happens that with closely set teeth the toothbrush is unable to remove all food material from between some of the teeth. The toothpick is then permissible; and the use of a dental floss silk for this purpose is also advisable. Dentists should be consulted frequently: every six months, even if nothing wrong with the teeth is suspected, is not too often.

Thrush. Thrush is a fungus which grows on the inside of the mouth. In appearance it is white, like little pieces of milk curd: sometimes there is inflammation of the mucous membrane of the mouth as well. The fungus is probably the same as one that grows in sour milk, and this suggests its means of access to the mouth. Thrush in itself is not dangerous; but as it usually occurs in small and badly fed children, especially in the hand-fed, so it has come to be associated with the presence of the other signs that go with poor nourishment.

Sometimes an appearance resembling thrush is found at the outlet of the bowels, when the thrush is popularly said to have 'passed through.' The parts should be washed with alum solution, Prescription No. 20.

For *treatment* of the disease in the mouth, the diet should first be attended to, often the addition of a little cream is what is required. After each meal the mouth should be wiped out with a swab of wool moistened in warm water, and then glycerine of borax applied by smearing it over the inside of the mouth with one's clean finger.

Vomiting. This may occur in infants from improper feeding and gastro-enteritis and the onset of one of the acute fevers. These subjects have already been dealt with. There is however one particular condition under this heading called Acidosis or Cyclical vomiting. Children are particularly liable to a disorder of metabolism in which poisonous acid bodies are produced. This disorder may be brought on by infections, by diet containing too much fat, and by an insufficiency of sugar in the food, and finally by over-exertion and excitement. The most likely child to be affected by this complaint is one of a thin nervous habitus, apt to get over excited on slight provocation. The symptoms are persistent vomiting, often high temperature and a sweet smell of acetone in the breath. The child will be constipated and will show considerable prostration, but the face is generally flushed. Attacks occur from time to time and are commonly precipitated by some change in the routine of the child's life. Most frequently a party where

excitement combined with rich and unaccustomed food have both been indulged to excess. The condition must be differentiated from the onset of acute fevers and from gastro-intestinal conditions. In the latter there is abdominal pain and tenderness which does not often occur in attacks of acidosis. The treatment is simple and may be divided into that during the attacks and that between the attacks. During the attack draughts of water containing sodium bicarbonate should be administered repeatedly, even if returned. Food should be limited to glucose water, to which orange juice may be added, and if this is vomited the feed should be repeated at once. Provided there is no abdominal pain or tenderness two teaspoons of Enos Fruit Salt or two teaspoons of milk of magnesia may be given at once. The attack subsides rapidly and the child is frequently well the next day. Between the attacks sources of infection must be searched for, *viz.*, tonsils and teeth; excitement should be avoided and the diet regulated, so that it is poor in fat and rich in sugar. Skimmed milk should be substituted for all milk, both plain and cooked; cream and butter must be absolutely avoided, though a few drops of ostelin may be added to the foods to supply the necessary vitamins. In this way the attacks will be prevented and in a few years the child will have completely grown out of the trouble.

Wasting. The wasting of children, which is sometimes called atrophy, or by doctors marasmus, is a symptom which may result from different causes. By far the commonest cause is improper feeding, and in that case the wasting is usually attended by symptoms of indigestion, pain, or diarrhoea.

Other causes of the wasting of infants are chronic constipation, heart disease and congenital syphilis, and in older children abdominal tuberculosis. It will, therefore, be quite evident to the reader that a child that is losing weight should be taken early to a doctor, in order that the cause of its wasting may be diagnosed. We will speak here only of the commoner causes of wasting, the digestive. It takes a very little divergence from the standard of milk given in the last chapter to render the food unsuitable for the infant at a given age. Sometimes it is the dilution of the milk that is at fault, and usually the dilution will be too little rather than too much. Sometimes it is the presence of too much cream that causes the indigestion and wasting. Or it may be the sugar that is in too large proportion and so upsets digestion. Or the child

may have been fed too often ; a nurse is sometimes tempted to quiet a crying child with a meal in between feeding hours, and this error applies to breast-fed as well as hand-fed children. The intervals and quantities given in Chapter XVI must be strictly followed. For often the quantities given are too large, and this may cause the wasting also. Mother and nurse are so pleased when baby takes all his feed and cries for more ; they give it him and he seems to thrive at first. He is bigger and weighs more than the average for his age, and he becomes an exhibition baby. Until one week when he does not advance and thenceforward falls weekly until he is a wasted child. Sometimes the same sort of thing happens when a child is put on to some new, usually a proprietary, food. He does very well at first, but not in the long run. We have already referred to constipation as a cause of wasting : the section on that condition should be read.

A wasting child is usually pale, with sharp features, thin arms and legs, and sometimes a prominent belly. He cries much in a minor key, often seems hungry at meal times, but unsatisfied afterwards.

The *treatment* of wasting must be directed first to finding the cause. If the child is breast-fed, do not wean him without doctor's advice. It is usually wrong to do so, and in any case he should be partially breast-fed, if not entirely. If hand-fed, be guided by the rules for hand-feeding given in Chapter XVI. If, in consequence, you find it necessary to alter his diet, begin him on less than he should be having normally, and gradually increase to that amount. Be very slow in your increases. For a child that is badly wasted it is, of course, necessary to consult a doctor. It is in such cases ass's milk has its use ; or a wet nurse if one is available. If the child is on modified cow's milk omit the cream, because wasted children are usually only further upset by excess of fats. For the same reason cod-liver oil does not suit them as a rule. See that the child is well protected from chills, especially round the belly. Medicines are not so much required as careful dieting, and must be adapted to the individual case. The extract of malt, half a teaspoon in a feed thrice daily, is often valuable in these cases.

Wetting the bed. The age at which a child develops control of his urination varies with the individual child, and depends much on the training he has received. A child's training in this respect begins with the first week of

his life, and a child trained by a good nurse should be by the time he is a year old, if not always clean in his habits, at any rate able as a rule when awake to give due notice that he will require attention. He will still wet the bed at night for another six months, perhaps up to two years of age ; but after the age of two and a half years such incontinence, especially during waking hours, is abnormal.

The complaint usually is a nervous one, and occurs mostly in neurotic children : fortunately it tends to get better of itself, and even in the worst cases has usually disappeared by the age of twelve years. But because the child tends naturally to grow out of it and because the treatment of the complaint is often attended with failure at first, the parent must not therefore adopt a policy of inactivity and wait for things to get better. For, meanwhile, the child will be growing up unduly sensitive and ashamed of his disability, and his education even may be interfered with. It is hardly necessary to say that a child who wets the bed should not be sent to a boarding school, which would unfairly subject him to a life of misery. Yet it is sometimes done.

In the ordinary course of his training a child should be made to empty his bladder at bedtime. If he wets the bed he should be roused again in the middle of the night, or at his parents' bedtime, to empty the bladder again. If such regular habits are insufficient to cure his disability a doctor should be consulted, and whatever treatment he recommends should be persisted in, in spite of the failure which at first is the rule rather than the exception. It is necessary to consult a doctor early for two reasons : one is that there may be some ascertainable cause of local irritation, the removal of which may cure the child's incontinence, and which it may take the doctor's trained skill to discover. For instance, sometimes thread-worms cause this complaint ; less often a long foreskin, adenoids, or even a stone in the bladder may be the cause. The other reason is that the complaint may often be cured by administration of the tincture of belladonna in large doses, beginning at 5 minims and working up perhaps to 20 minims thrice daily ; but such large doses are not to be given without medical surveillance, as the symptoms produced may be alarming. It may be dangerous to give anything like that dose to some children.

Moreover, a skilled examination of the urine, such as can only be performed by a doctor, is essential in each case.

Apart from the treatment already suggested, in a nervous child success may be attained by giving $\frac{1}{2}$ ounce of Prescription No. 55 at bedtime: sometimes double that dose may be necessary. As regards diet, there should certainly be no tea or coffee allowed and no fluids after 5-30 p.m., and the restriction of starchy and sugary foods is helpful. No green vegetables or fruit, and very little sugar. Steady persistence in treatment is required in spite of an initial lack of success.

CHAPTER XVIII

THE PRESERVATION OF HEALTH

EVERY officer, on first arrival in India, brings with him one priceless possession, sound health. He should study how to preserve it. Not only is a life of constant or frequent sickness somewhat of a burden, but no officer can hope to rise to the head of his department, or, having risen, successfully to take up that post, without good health. The higher the appointment, the greater the demand on the energies of the individual, and one of the first requisites for high office is physical ability to stand the continuous strain of hard work under the trying conditions of the Indian climate. It becomes the interest, therefore, as well as the duty, of every officer to take such precautions as are practicable to preserve his health throughout his service in India.

Formerly service in the East was looked upon as a gamble with one's health, as a career bound to be attended with a considerable amount of sickness and ill health. This inevitable illness was attributed to the influence of the climate. The liability to disease was supposed to lessen with lengthened residence, as a result of acclimatisation. We have learned much regarding tropical diseases of recent years, we are on the eve of discovering much more, and the time is coming when, with the exercise of due precautions, residence in India, as regards adults, will be attended with but few more risks to health than would be incurred in an equal period of life spent in Europe.

The Indian climate causes discomfort to Europeans, and prolonged residence leads to enervation, and may thus predispose to disease or retard recovery from illness once contracted; but the chief cause of sickness is now known to be the numerous parasites which flourish in the tropics and prey on the European immigrant. The late Sir Patrick Manson has stated that 99 per cent. of tropical diseases are caused by germs. The preservation of health depends, therefore, upon the avoidance of these parasites, their destruction, or the neutralisation of their powers of mischief. The acclimatisa-

tion of the old resident is largely the personal application of knowledge, learned in the bitter school of experience.

In England, where sanitary measures of far-reaching effect have been carried out and millions of pounds spent in the process, the individual's health has been safeguarded on every hand. His drinking-water has been filtered and regularly submitted to rigorous bacteriological tests; waste water, sewage and house refuse have been removed, and treated by the latest scientific methods. The purity of his food, meat, and milk supply have been under constant supervision. Daily notification of all cases of infectious disease has resulted in the prompt isolation of all such persons liable to infect him; even the domestic animals have been on occasion inspected to see that they suffered from no disease transmissible to man. Accustomed from childhood to these precautions and safeguards he accepts conditions as a matter of course. Arrived in India, according to the station to which he is posted, he may find few or none of these safeguards to his health in existence. He may in future have to supervise his own water-supply and act as his own food inspector. In accordance with the way he carries out these duties will be the state of his health, for the experiment which he is now making is a personal one; his own health is the stake, and he himself the party most concerned. The responsibility cannot be thrust upon another. The sanitary precautions which are recommended in the following pages have been made as few and as simple as possible. They will not be found unduly difficult to observe, and once they become a routine procedure, the little trouble involved will hardly be noticed. Much may be learned by a short residence in the bungalow of a senior officer.

The hygienic measures to be adopted may be divided into those that are Environmental and those that are Personal. Methods directed to the prevention of special diseases such as malaria, small-pox, enteric fever, cholera, and plague have already been described, and will be found under the headings of those diseases. Environmental hygienic measures with slight modifications are applicable, though seldom applied, in all parts of India; but personal hygiene must be varied in accordance with local and seasonal variations of climate and physical conditions of the country.

ENVIRONMENTAL HYGIENE

Environmental hygiene includes: (A) the choice of a

residence and attention to its light and ventilation ; (B) attention to the conservancy of the premises and its neighbourhood ; (C) the provision of a pure water and milk supply ; (D) the quality of the food supplied, and the methods of its cooking ; (E) war against flies.

A. HYGIENE OF THE HOUSE AND COMPOUND

There are few stations in which the newcomer has much choice of a bungalow ; he is generally obliged to take whatever house may be vacant at the time and suited to his modest pay. Thatched roofed bungalows are cooler, and in the rains drier than those with terraced roofs, but they are burdened with many disadvantages. If cool, they are dark, and swarms of mosquitoes hide about the bamboos and thatching of their verandahs. Rats take up their residence above the ceiling cloths, occasionally snakes, or civet cats ; the latter in the breeding season stink abominably. In the rains the thatch rots, and during the annual repairs the bungalow is filled with the most objectionable dust. There is, moreover, the danger of fire, not only arising from the carelessness of one's own servants, but also originating elsewhere from the carelessness of others, and carried on to the thatch in the form of floating sparks, etc. It is impossible to keep such a dwelling free from mosquitoes. Of late, improvement is manifest in the type of houses built for the European residents. The old-fashioned thatch roof has been largely replaced by pucca or tile roofs.

In towns building by-laws have been generally adopted which for the future should ensure that the minimum sanitary needs of the buildings will be secured. It is impossible to frame rules for the construction of a dwelling-house adapted to Europeans and suitable for every part of India, as the material available and the climate differ in various parts of the country.

Where the selection of a residence is possible the following points should receive attention :

Site. The house should be on well drained ground either raised or on a slope. It is generally advisable to have it open to the prevailing winds, but shaded by a few trees. It is a mistake to have many trees close up to the house. A good rule is that no tree should be so near that it would fall on the house if blown down. Except in hill stations and the North

where the winter is severe the principal rooms should face North or East. The soil should be porous and not retentive of moisture, gravelly and sandy soils being the best. The house if of masonry should be built on a pucca plinth at least 2 feet in height.

Rain-water should flow rapidly away from the house ; that falling from the roof should impinge on stone slabs to prevent erosion and the formation of pools of water near the foundation. Generally speaking, roof guttering is undesirable and unnecessary in houses not over two storeys in height. Defective guttering is a frequent cause of mosquito breeding the gutters becoming blocked by fallen leaves or sagging and causing pools to form. In malarious areas no roof guttering should be permitted.

Floors. With recent advances in the knowledge of disease and its causation, the importance of well-made cleanly floors has become more evident. Badly made concrete floors are easily riddled by rat holes, and allow plague-infected rats to die in close proximity to the inmates. Dusty floors harbour and facilitate the breeding of fleas, by which the virus of plague is carried from rat to rat and from them to the human residents.

Floors should be composed of 4½ inches of lime-concrete covered by 1½ inches of cement-concrete, or brick on edge well pointed with cement, or of smoothly hewn stone of a non-porous description. Almost anything is preferable to the ordinary earth floor, through which not only damp but bad air may rise ; for the atmosphere does not end where the earth begins, but permeates it in all directions, and in winter the interior heat may draw through the soil noxious gases from the neighbourhood. Lime-concrete floors are liable to break, require constant repairs, and unless thickly covered feel cold, while thick coverings harbour dirt and insects. A very useful and cleanly floor is made from lime concrete with cement facing, in which patterns are worked by insertion of small pieces of broken crockery. The cleanest and best floors are of glazed tiles in the plains and of wood in the hills, where white ants are not prevalent. Where wooden floors are employed a ventilated air-space must be constructed beneath the floor to prevent dry rot. To keep white ants out of floors the 2 feet plinth should be constructed with 6 inches of sand below the concrete. It might be healthier if floors were kept bare, but constructed as they are of cement or merely beaten

plaster, it is customary to hide their nakedness with some sort of covering. For this purpose bamboo matting has been extensively used in the past. Under this matting a terrible collection of dirt speedily forms which cannot be removed without lifting the matting, a troublesome process. It is much better to use cotton dhurries which can be swept and are easily lifted and cleaned.

Walls. The materials with which walls are constructed will differ largely in accordance with the character and cheapness of the materials available and with the needs of the district and climate.

Thick Walls. Thick walls keep out the heat during the day, though they retain it to some extent during the night. Thin walls are unbearable to live in, in the hot weather, especially in the northern provinces of India. Outer walls should be about $1\frac{1}{2}$ feet thick, and should consist of first-class brick, lime pointed. Inner walls may be of second-class brick in mud: and partition walls may be as thin as 14 inches. In Burma, wood was till recently entirely used in the construction of the houses, the walls being often simply lattices or jilmils which can be opened up for the free entrance of air from all sides of the houses. In the hills brick is difficult to obtain. The outer walls are of stone, lime pointed, and the inner of stone in mud. Indian houses, as a rule, except in the plains of Bengal, Madras and Bombay presidencies, possess chimneys and fire-places. Such apertures assist the ventilation of the apartment; during the rains fires may be advisable on account of damp; whilst in northern districts fires are always acceptable, if not actually necessary, during the cold weather.

Plaster. Irregularly plastered walls rapidly show a deposit of dust. The plaster should be composed of 1 part cement, 1 part lime and 7 parts sand and smoothed by the use of a long, square, wooden rod which when pressed over the walls gives an even surface.

The house should be kept as clean as possible. It should be limewashed throughout at least once a year, twice would be better. It should not be heavily furnished, and if curtains must be used for privacy and aesthetic purposes, they should be few in number and light in colour, as on all dark materials mosquitoes love to hide during daylight.

Roofs. In the plains the best roofs are jack arches on steel beams over which 3 inches of lime-concrete is placed.

Double interlocking tiles also make a very good roof, as does the Mangalore tile. There are also several tiles made with an asbestos base which have proved satisfactory. Country tiles should be avoided as they require constant expense for repairs, are easily displaced by high winds and monkeys, and harbour rats and squirrels. In the hills galvanised iron sheets are frequently employed. In Burma sloping roofs are used, generally composed of teak shingles or of galvanised iron sheets, the sides of which are turned upwards and nailed into a batten. The edges are covered over with strips of sheet-iron forming semi-circular channels, which are placed with the concavity downwards over the upturned edges of the sheets.

Ceilings. Ceilings in the plains in modern houses are usually of the jack-arch type and colour-washed. Ceiling-cloths made from whitewashed cotton-cloth look neat when first constructed, but always become rat-ridden sooner or later and most objectionable. In the hills the ceilings of wood with a beading of various patterns are much better constructed than in the plains.

Verandahs. In the plains verandahs cannot be dispensed with, and their breadth should be at least 8 to 10 feet. On the verandahs it is customary to keep a few ferns and shrubs in pots: the fewer there are the better, as they form harbouring places for mosquitoes.

Doors and Windows. In malarious localities external doors and windows should be protected from the entry of mosquitoes by netting them with wire gauze of 14 mesh to the inch, the wire being 28-30 S. W. G. and made of rustless bronze, monel metal or brass. External doors should be double with a short passage between and should be arranged to open outwards. Where glazed windows are required they should be made to open inwards and the window space netted over with the gauze applied on the outside. Doors and windows are preferably made of teak wood which is not attacked by white ants.

Light and Ventilation. The action of sunlight and oxygen in the destruction of harmful bacteria is well known. The aggregate window area in a room should total not less than one-eighth of the floor area. Ventilation, when the doors and windows are closed, should still be maintained in lower rooms by the construction of clerestory windows opening 1 foot beneath the roof level, or in upper rooms by ceiling ventila-

tors, or in rooms with no ceilings by ridge or eave ventilators.

Space. The dormitory space found necessary for soldiers in European barracks is 90 superficial feet and 1,800 cubic feet per man, and private houses should not give less. In European hospitals 120 superficial feet and 2,400 cubic feet are allowed, showing the greater necessity of fresh air and ventilation in the sick chamber. But no artificial ventilation and no amount of cubic space will obviate the necessity for natural ventilation, and this is only obtained by open doors and windows, or the accessory methods of ventilation noted above. In the hot season it is often necessary to close the doors and windows during the day to prevent the entrance of hot winds, but on the approach of sunset, doors and windows should be thrown open for the free admission of air throughout the dwelling. Gauze doors and windows should be closed about 6 P.M. to prevent the entrance of mosquitoes.

The Compound and Servants' Quarters. The compound ought to be kept clean and free from jungle. It is desirable that it should be covered with grass kept short. Grass-cutters should not be permitted to remove every particle of grass as is their custom. A few trees, if they are not situated too near the bungalow, are an advantage. Their shade is useful to the owner's horses, which cannot have too much fresh air and which are frequently groomed in the open under a tree instead of in the stable. There should be no hollows to permit of the collection of rain-water. Old tins, broken bottles and crockery, coconut shells, etc., which may hold water and breed mosquitoes should not be permitted to lie about the compound.

Amongst the virtues of the Indian servant a knowledge of and attention to sanitation are not included, and hence it is necessary to pay periodic visits of inspection to his quarters to see that the more obvious sanitary rules are not neglected. The quarters should not be entered without due warning, as his female relations often reside with him. It is a good rule to inspect the cookhouse, servants' quarters and stables each Sunday morning. Points to observe are that kitchen refuse is not allowed to accumulate, holes or irregular drains to be made, or empty tins left lying about. Cakes of cow-dung should not grace the walls, and all stable refuse should either be removed at once, or dealt with as described below. There will usually be only one well in the compound. This well

should be cleaned out each hot weather and ten to twenty seers of freshly slaked lime or a good handful of tropical chloride of lime thrown into it to sterilise the water. The water of a second well, if there is one, should be used for the horses and for garden irrigation. It is just as well to inquire where the dhobi actually washes the clothes, and if in some filthy tank, as is not unusual, a resort to a cleaner supply, such as a running stream, must be insisted upon. Particular care should be taken to look for rat holes beside servants' quarters. Their presence invariably indicates that waste food is thrown out instead of being collected and placed in a covered rubbish bin.

B. CONSERVANCY

Too much attention cannot be paid to the removal of excreta from the house and compound. Constant inspection is necessary, or the compound will be polluted by the native servants, and by bathroom refuse carelessly deposited by the sweepers in any corner. It must be remembered that the germs of many diseases, including typhoid, cholera, dysentery, and infantile diarrhoea are given off from the body in the urine or faeces, and that if these insanitary conditions are allowed to continue, and excreta left exposed the germs are again carried back into the house by flies. In municipalities dejecta from the bathrooms should be removed daily in covered receptacles and commode pans should be cleaned with a reliable disinfectant, such as, cresol, izal, cyllin or sanitas. In places in the plains where there are no municipalities, dejecta should be taken away from the houses for a distance of 400 yards, and carefully buried or burnt in incinerators. Where cholera or typhoid has occurred, the dejecta should be mixed with chloride of lime or one of the above mentioned disinfectants before being disposed of. If no disinfectant is available they may be boiled in kerosene oil tins before burial. It is important to prevent flies gaining access to them.

It should be recollected also that Indian pigs and cattle will greedily devour human ordure, especially in the hot season when grass is scanty. In this manner infection with tapeworms may be conveyed through flesh food into the human system. Moist soil contaminated with infected faeces is the common means of hookworm gaining entrance to the body, the young worms passing through the unbroken skin of the unshod feet. -

C. PROVISION OF PURE WATER AND MILK SUPPLY

Water. In the larger municipalities the water supply is obtained from lakes, rivers, canals or tube wells. It is usually purified by filtration through sand or by chlorination or both, but it is always wise in India, before drinking tap water, to enquire whether the supply is pronounced safe by the Health Officer. Wherever such purification is not effected the water must be boiled. In the smaller towns and villages it is rare to find a safe drinking water supply. Water from surface wells is always liable to pollution from the soil, and from the open top through the vessels and ropes used for drawing it. Similarly the water of small streams, ponds and tanks is usually polluted, particularly at the margins where it is drawn. In all such cases the wise thing is to boil sufficient water for drinking each day and store it in bottles kept in an ice-chest or placed in baskets filled with dampened grass and swung from a tree or verandah beam in the shade. Where the water is not clear it may be filtered through a domestic candle filter, but since bacteria can grow through the pores of the candles, such filters cannot be relied on to give a safe water unless they are in perfect condition with the candles free from cracks and tightly screwed in place and unless the candles themselves are boiled twice a week. The sediment which collects on the outside of the candles needs to be brushed off before boiling them. On the whole it is best to regard these small domestic filters as an auxiliary means of purification and, when they are used, to boil the water after filtration.

Milk. In India milk, from its liability to intentional adulteration or accidental contamination and from the fact that it forms an excellent medium for the growth and multiplication of many dangerous germs, is a perilous fluid to consume in its raw state. It should be sterilised by boiling before use. If not obtained from one's own cow, it should be obtained from a cow milked on the premises, if such an arrangement is feasible.

Having sterilised the milk it is equally important to preserve it from outside infection. Such infection is most likely to be brought by flies and it is important to appreciate the fact that one fly, lightly settling on a jug of milk, may convey to it the organisms of cholera, or enteric fever, or dysentery; and that in a very short space of time the whole of that milk

may be teeming with dangerous germs. All vessels used for holding milk should be cleaned in the usual way and then well scalded with really boiling water.

The best way to keep milk after boiling is in jugs or bowls covered with pieces of thin muslin weighted round the edges with beads to prevent their blowing off. A large supply of such d'oyleys should be kept, of sizes to fit various vessels and enough to allow of their being frequently washed.

D. THE QUALITY OF THE FOOD-SUPPLY AND THE METHOD OF COOKING

In the larger municipalities the meat is now under inspection, but where this is not carried out the reader will need to use his own discretion. Tainted meat must at all costs be avoided. Owing to the rapidity with which putrefaction sets in in warm climates meat is generally consumed shortly after it is killed. When it is to be kept overnight it should be washed with vinegar and hung up in a cool meat safe to which flies have no access. Modern invention has brought small house refrigerators within the reach of many and their use enables meat to be kept for a day or two. Even where they cannot be afforded ice is usually obtainable and uncooked meat and fish may be kept safely for 24 hours on ice.

During the prevalence of cholera over-ripe and soft fruit, and all salads should be avoided. All food should be eaten hot as the danger of pollution by flies is thereby avoided.

Continued heat is apt to impair digestion and in the hot weather the quality of most foods is at its worst. Great care therefore is required in cooking and here the master or mistress comes up against strange methods not contemplated by Mrs. Beaton and cooking places and appliances mediæval in design compared even with the simplest type found in a labourer's cottage at home. The reason for this is the natural conservatism of the native cook and the curious obsession existing in the minds of old residents and many P. W. D. officials that modern cooking ranges and hot water systems are unsuited to conditions in the East. Fortunately ideas are changing and in the larger towns the demand for up to date kitchens is increasing, but elsewhere the would-be domestic scientist is still faced with absurdly primitive conditions. Where only the Indian pattern of cooking stoves or 'Chula' exists the

Mem Sahib may buy a good type of kerosene burning stove at a reasonable price and either practise on it herself or teach her cook to use it. Indian cooks have many methods of rendering tough meat edible: roast meat and roast fowls are seldom sent to table without having received a preliminary boiling by which the nutritious juices are largely extracted. Green vegetables are usually boiled till little but cellulose is left and the cook will always throw out the water containing the nutriment unless he be stopped. With a little expenditure of time and trouble he can be taught to steam vegetables properly in a minimum of water. A constant source of dirt and contamination of food is the use of dirty jharans (dusters) and cloths for straining soup and milk. The housewife should give out daily a special muslin square to strain the milk, and clean dusters for the pantry and kitchen. Too much stress cannot be laid on this most important item in the house-keeper's daily routine work.

E. WAR AGAINST FLIES

Reference has already been made to the dangers of flies and to the diseases that may be conveyed by them. Everything possible should be done to lessen their numbers. As a rule flies will be found most numerous at those intermediate seasons when it is neither too hot, nor too cold, nor too wet, for excessive heat, cold, and rainfall are all inimical to their development.

Several species of fly may be found about the house; but they all have the same filthy and dangerous habits. Flies breed in human or animal excrement or in decomposing food refuse or any filth, provided it is fairly moist.

The female fly lays about 120 eggs in one batch, and during the year lays four such batches. In from one to four days each egg hatches into a larva, which is a small footless cream-coloured maggot. The larva becomes fully grown in about five days and buries itself below the surface. It then becomes a pupa, and remains so for three to five days, after which the adult emerges and works its way to the surface. Flies convey disease by resting and feeding on filth, as in latrines, and then settling on our food, salads, cold meats, bread, cake, etc., or on the baby's milk or on our lips or hands. They carry germs on their legs and proboscis and also vomit them and pass them in their excreta.

All larders and food should therefore be protected by screening and a form of fly-proof latrine should be adopted in the compound. All refuse and other material in which they may breed should be collected and burnt regularly. A small incinerator in the compound is the best way to deal with manure and combustible refuse. For destroying flies inside the house the well-known 'Tanglefoot' papers are useful. There are many forms of fly-trap in use, some suitable for the compound, others only for use indoors. Amongst the latter is the Japanese revolving trap, operated by clockwork; this trap should be so placed that a bright light falls upon the slit leading to the metal cage. Since flies are attracted by a bright light larders, kitchens and dining rooms should be well shaded.

Various forms of poison-bait are also used indoors and on a large scale out of doors. A suitable formula for use in a room is :

Milk.	.	.	.	.	.	.	7 parts.
Formalin .	.	.	.	.	.	.	1 part.
Lime water	-	.	.	.	.	.	25 parts.

with a little sugar added. The lime-water is a necessity, because commercial formalin is acid, and flies dislike acids.

This solution should be spread about on tables and shelves in the form of drops, or bits of bread can be soaked in it. Where flies are numerous in a station you may be sure that the system of disposal of refuse or excreta is defective and you should take the matter up with the Health Officer.

PERSONAL HYGIENE

Habits. Early rising is the rule in India, and one to which the newcomer will speedily learn to adapt himself, provided he follows the first part of the maxim, and goes early to bed. Whatever the young officer may have been able to do at home, he will soon find that late nights do not agree with him in the East, especially in hot weather, when, owing to the discomforts of the heat, etc., rest is so disturbed and sleep so coy. To be up and fresh at six in the morning necessitates retiring at ten the previous evening.

A daily bath in India is not a luxury but a necessity, and there are many occasions when a second one does not come amiss. Old residents usually take a warm bath followed by a cold douche, and this procedure is probably the safest and best: though there is no objection to a cold tub if personal

experience shows that it does not disagree. The cold bath, however, should be avoided if one is subject to looseness of the bowels or has recently suffered from fever. A swim in cold water is a great luxury when obtainable : experience however would seem to have been against it from a health point of view in the past, as many of the old station baths and bathing platforms, etc., have been allowed to fall into disrepair and consequent disuse. There are indications, however, that modern swimming baths properly constructed and with filtered and chlorinated water provide a healthy form of recreation.

Clothing. The new arrival will soon learn to adapt his clothing to suit the climate of the part of the country in which he is stationed. He is advised to buy most of his thin clothes in the country of his adoption. By doing so he will be supplied by persons familiar with his requirements with articles suited to his needs, and not loaded up with useless and unsuitable kit destined, after much journeying, to feed moths and white ants. The great desideratum is to be so clothed as to avoid contracting a chill. For this purpose it is usually necessary to wear some light absorbent material next the skin. Articles entirely made of wool are apt to be heavy and to shrink greatly after washing. To avoid this, vests and drawers are made of loose woven cellular cotton or of wool and cotton or of wool and silk, or of silk alone. Thus protected against chill, the other articles of clothing can be adapted to the demands of the occasion and the season, khaki drills and serges for travelling and shooting, tussore silk or palm beach suits for office wear, and suits of various kinds of light and medium materials, to be procured from any tailor for wear on other occasions. In the hot weather and rains, whenever possible, it is a great comfort to wear suits that can be washed. Your tailor may be trusted to make your clothes fit loosely, a point of comfort which is apt to be overlooked when the suit has been made in England. For night wear light woollen pyjamas should be used during the colder months. These, however, are too thick for hot-weather use in India, and must then be replaced by similar garments of silk or cotton. The latter may safely be used if the precautions noted below are carried out.

Just as in England many serious diseases have their origin in a common cold, and diseases of the respiratory tract are to be particularly guarded against at certain times of the year, so in the tropics serious intestinal affections follow upon, if they do not arise from an abdominal chill ; for in the tropics the

abdomen and its contents represent the danger-zone rather than the organs in the chest. The time of greatest danger of an abdominal chill is whilst asleep during the rains, when after a heavy downpour there may be a rapid fall of temperature. To obviate this danger of chill, the wearing of cholera belts, broad woollen bands to cover the abdomen, used to be advised. Their use is however not free from objection; they are apt to slip out of position during sleep and, when they retain their place, frequently induce a band of prickly heat, the irritation from which causes disturbed sleep. Their constant use, by keeping the skin moist with perspiration, tends to weaken the natural powers of resistance of the protected area to changes of temperature. It will usually be sufficient precaution if the jacket of the pyjama suit be long enough to tuck it well into the pyjamas, to prevent exposing the abdomen. In addition, a spare sheet or blanket should always be on the bed inside the mosquito curtain and one loose end of this should be placed across the abdomen, the remainder lying free. The sudden changes of temperature which take place usually produce a semi-conscious state at the time of occurrence, and it soon becomes habitual to pull a little more covering across the abdomen, sufficient to prevent a chill. One who has suffered from cholera, diarrhoea, or dysentery may experience a feeling of relief and comfort from a cholera belt, but a woollen puttee bound around the gauze vest or pyjama jacket will afford the same benefit without the disadvantages. The man who has always been in the habit of wearing a flannel cholera belt in India cannot discard it with impunity. He should wait till he gets to a temperate climate when the vessels of his skin recover their tone and then abandon it. The new arrival in India should not, except under medical advice, take to a cholera belt.

As a protection against the heat of the sun a sun helmet or topee of solar pith or cork is requisite. This should protect the temples and nape of the neck as well as the top of the head. The newcomer is advised to purchase a pith topee of the Cawnpore Tent Club pattern. Individuals who are especially sensitive to heat may have their riding and camp jackets fitted with a spinal pad to protect the spine when riding or driving long distances in the sun. These can either be built into the jacket or made to fix on with buttons when required. Some people are strong in the praise of the so-called sun-proof fabrics that are supposed not to allow the harmful rays

of the sun to pass through them. There is no harm in trying these, but our experience of them does not indicate any marked advantage. Light coloured fabrics which reflect light and heat rays are cooler than dark fabrics which absorb them.

Bedding. It is customary in India, when travelling, for each person to take with him his own bedding. This is generally carried in a type of waterproof canvas holdall, with long straps known as a Wolseley valise, which is easily unrolled and which keeps the bedding dry.

Food. As a rule too much food is eaten by Europeans in India and of too rich a character. The appetite is stimulated on first arrival in the tropics and the tendency in messes, clubs and at dinner parties is for rich meals of many courses to be served. In particular, a reduction in the quantity of meat consumed and its substitution by vegetables, salads and fruits is desirable. Meat should always be well cooked owing to the greater danger in this country of its being infected with parasites. In the hot weather the choice of vegetables and fruits becomes restricted and ingenuity in the planning of meals and conservative cooking are required. Salads are best grown in one's own garden and the plot should preferably be enclosed by wire netting to prevent destruction or fouling by stray animals. Some salads such as mustard and cress may be grown in boxes on verandahs and thus sheltered from excessive sun or rain. Of late years a great variety of tinned foods have become available and with proper precautions their use in moderation is beneficial. The tins should be of a good brand and obtained from a dealer whose turn-over is large enough to ensure freshness. They should be in good condition and must not bulge at the ends, this being a sign of gas formation owing to decomposition within. As soon as a tin is opened the contents should be turned out into a clean dish and consumed the same day. The process of canning food has improved so much of recent years that many of the older objections to tinned foods have now little or no foundation. Ptomaine poisoning from foods canned by a good firm and reasonably fresh is very rare and even in the case of fruits and vegetables much of the vitamine content, so important to health, is retained by modern methods of canning. Nevertheless it is a good rule to eat some fresh raw food every day. This is particularly necessary in view of the tendency of Indian cooks to over-cook and cook foods long before meal times and keep them hot until required. All residents in the East should

have some knowledge of the principles of cooking such as can be obtained from any good book on the subject.

Drink. The most natural drink is water. Unfortunately in India it is usually open to suspicion and the only safe rule in upcountry stations is to boil all drinking water. Boiled water is apt to be insipid but at least it is safe if poured, while really hot into bottles so as to scald them, and stoppered at once. Its taste can be improved by adding lime or lemon or orange juice. Some persons find that excessive consumption of lemon drinks favours the onset of boils, but in such cases the excessive consumption of sugar in the drinks is the more likely cause. Aerated waters and particularly soda water, is a fairly safe beverage because of the carbonic acid gas contained, but here too care should be taken to obtain aerated water from a good factory inspected by the health authorities. Aerated water does not quench thirst so effectively as plain water and its excessive use tends to promote indigestion. Weak tea is an excellent drink and is the best of all when cholera is about, or to carry in a flask or Thermos bottle for use on the march and in camp. Lemon or lime juice is a good substitute for milk in tea when this is not obtainable or doubtful in quality. Coffee and cocoa, excellent in the cold weather, will generally be found too heavy by most persons during the remainder of the year.

Alcohol. As regards the use of alcoholic drinks, there can be no doubt that the more sparingly they are partaken of in India the better. So long as work, physical or mental, has to be performed abstention should be the rule. It follows, therefore, that no alcoholic drinks should be consumed during the day. With the evening comes relaxation from the day's labour, when stimulants may, with less harm, be indulged in. It would be better still if their consumption were delayed until the dinner hour. In whatever form alcohol is imbibed, it should be drunk well diluted. Short drinks are most injurious; the practice may be excused, it cannot be defended. The consumption of alcohol amongst Europeans in India is steadily diminishing, and with this reduction is a corresponding improvement in the sickness and mortality. One hears less nowadays of sudden deaths from heat apoplexy, which formerly from old records would seem to have been so common. Certain it is that the very worst preparation for prolonged exposure to the sun in the open is a previous overdose of alcohol.

Exercise. Whilst it is true that severe muscular work and great mental activity are incompatible, the double tax on the majority of individuals' energy being too heavy, still some form of bodily exercise is essential in India if health is to be maintained. The brain is clearest and the body most vigorous in the early morning after a good night's rest, and hence if much mental work has to be got through, a beginning should be made soon after *chota hazri* and the taking of exercise postponed until the afternoon. If both outdoor work and office work have to be performed each day, then it is better to get the outdoor work done early in the morning, so as to avoid the greater heat of the sun later in the day, the office work being performed subsequently. The most convenient time for exercise will be found to be in the late afternoon, after the conclusion of the day's work. Whenever possible, the exercise, whatever form it takes, should be carried out in the open air. The close, heated air of an Indian racket court is the one objection to an otherwise excellent game. The recreation finished, clothes wet with perspiration must be changed at once and much illness will thereby be avoided. If for any reason to change is impossible, a sweater should be donned immediately, and the change subsequently effected as early as possible. To sit down to cool is to court a chill. After violent exercise a shower bath is very grateful. In a few stations plunge baths are still maintained. If made use of, there must be no hanging about; the time for their use is immediately after the game; the plunge should be made whilst piping hot, before any cooling off has taken place. It should be no more than a plunge and should be followed by a good rub down and clean dry clothes. No person who has recently recovered from malarial fever, or is subject to malarial attacks, should indulge in this luxury, and the same holds good, only more emphatically so, for sufferers from any form of diarrhoea or dysentery.

Camp Life. Life in camp in the cold weather is very enjoyable and, with a few simple precautions, very healthy. No trip should be made without a mosquito curtain for protection at night, a good mackintosh sheet to ensure the bedding being dry, and a kettle for boiling the drinking-water. Particular care should be taken over the milk and drinking-water, and the general principles laid down on a previous page relative to these articles carried out. It is sometimes convenient to take one's own goats with one on the march, and this is

sometimes a good thing provided they are healthy goats. In Bundelkhand some of the goats suffer from Malta fever and the disease may be conveyed by their milk unless it is boiled. Vegetables locally procured must only be eaten after being thoroughly cleaned and cooked. As regards medicines it will generally be sufficient to make up a modified equipment based on that suggested in Chapter I and in Chapter VIII, and having regard to the proximity of small dispensaries and other places for obtaining supplies readily.

Every officer going into camp should have a map of the district with him; on this he should mark the sites of the Government and District Board dispensaries, every year growing more numerous and better equipped, and officered by doctors whose knowledge of their profession is rapidly rising with each batch turned out annually from the medical schools. The presence of these dispensaries has done away with the necessity of carrying about in camp a stock of drugs which become inert from age and exposure.

HILLS. As business or pleasure may necessitate a visit to the hills it may be mentioned that the sudden change in temperature and atmospheric pressure which is experienced in making the ascent, is not unattended by risks. On arriving at the foot of the hills and prior to the ascent, some thick flannel underclothing should be worn and an overcoat should be placed over the back of the seat ready for wear should the officer feel chilly. On arrival at the hill station no violent exercise, such as tennis, football, or polo should be indulged in until the expiration of at least a week. This interval gives the heart and lungs time to adjust themselves to the altered conditions of the rarefied atmosphere. A chill whilst in the hills is apt to be followed by a peculiar troublesome diarrhoea, the so-called 'hill diarrhoea' (*see* p. 125). One who dreads or is susceptible to hill diarrhoea should observe the following rules strictly for the first week: over clothe; under eat; avoid strenuous exercise; cut down alcohol and don't touch beer.

CHAPTER XIX

NURSING

Aspect and Appearance of the Sick-room.

The Sick-room. The sick-room should obviously be in the quietest part of the house. In India it will frequently be advisable to choose the coolest room. Hence one with an adjoining veranda would be preferred as preventing contact with the direct rays of the sun. The room should be lofty and high, admitting as much air as possible, and containing little furniture. In cases of infectious diseases all hangings, carpets, and curtains should be removed.

The Bedstead. This for preference should have a spring mattress; and it is essential that the bed should not be too wide, a feature sometimes overlooked in private nursing when one is called upon to nurse a patient on a double bed. If too wide, it will be impossible to nurse the patient, to change the sheets, or to attend to helpless cases with any degree of comfort. For bedridden cases a high bedstead is less tiring for the nurse and does not affect the comfort of the patient in any way. An ordinary bedstead may be used and raised to a suitable height by the use of four wooden blocks. If this is done, care must be taken that the legs of the bed do not slip off the blocks. This can be done by having a circular depression made in the centre of the blocks, large enough to hold the legs of the bed.

Its Position. The bed should not be placed up against the wall, though on occasion this will be found useful in helping to prevent a delirious patient from falling out; nor should it directly face the light, which should be allowed to fall cross-ways on to the patient except in most head injury cases when it is necessary to place the patient with his back towards the light.

Plenty of fresh air is essential without the presence of draughts, which can be excluded by means of screens, or in the absence of these, by means of a blanket or rug hung on the mosquito frame.

Mattresses. The most desirable mattress is a horse-hair one, but often in the hot weather in India all that can be tolerated is as light a one as possible, sometimes a piece of matting over the quilt on the bed giving the greatest degree of comfort.

Cleanliness of the Sick-room. This is one of the most important duties for which the nurse must be responsible. A daily dusting of the furniture, preferably with a damp cloth, is essential, also a proper and efficient sweeping of the floors. This should be done in such a manner that as little dust as possible is created, for which purpose tea-leaves sprinkled on the floor before the sweeping is done will be found useful. For infectious cases, washing the floor with some disinfectant such as Sanitas or Jeyes' Fluid, or anything else ordered, added to the water is to be recommended. No food should be allowed to be kept in the patient's room, everything of this nature being kept in an adjoining room easily accessible to the nurse.

All excreta should at once be removed, and if required for the doctor's inspection should be kept in covered vessels, and disposed of afterwards on the earliest possible occasion.

The Qualifications and Duties of a Nurse.

The private nurse, though having ordinarily only one patient to look after instead of a wardful, has often much more responsibility thrust upon her than the hospital nurse, necessitating the exercise of a nice judgment and common sense; for during the absence of the doctor she is entirely responsible for the well-being of the patient. She must therefore be careful to obtain full particulars as regards the treatment ordered, and must anticipate as far as possible all eventualities that might arise during his absence, and get his directions how to deal with them. If not actually required to prepare the patients' food herself she will be called upon to supervise the preparation of it, hence a knowledge of sick-room cooking, including the making of artificially digested foods, such as Benger's Peptonised Milk, &c., will be necessary. Anxious, though well-meaning relatives will be a constant source of trouble to her, calling for the exercise of much tact and patience; however, the doctor's orders as regards visitors, either members of the family or friends, should be rigidly adhered to. She must be bright and even tempered, firm yet always courteous. Gossip of all kinds

in the sick-room should be avoided, especially the recital of harrowing tales of her former experiences. As a private nurse, she will be called upon to suit herself to the needs of each case, so must not insist on imaginary rights, being ready and willing, if asked, to perform other than what might strictly be called her professional duties.

She must be clean, punctual, obedient, and observant, and cultivate the habit of accurate statement, which is most important in nursing, as it helps the doctor to a correct diagnosis of the case.

She will find the form (p. 548) of bedside report most useful.

Among the points to observe in connection with her patient are :

His Position in Bed. Whether he is quiet or restless ; preferring to lie with his knees drawn up, which is an indication that this position gives him the most ease, as thereby the muscles of the abdomen are relaxed ; if in that position, whether he is quiet or restless, as in colic. Observe if he has a preference for lying on any particular side, as in pleurisy and pneumonia, when usually the affected side is chosen. Difficulty in breathing will make him want to sit up, and in heart diseases a leaning-forward position over pillows or even the back of a chair may be voluntarily chosen. Any tendency to lie with the head thrown back, especially in children, should be noted, as also a tendency to slip down in bed, requiring him to be constantly lifted up. The latter is an indication of extreme weakness, as is also sleeping with eyes half-open. Absolute stillness and helplessness, with no desire to do anything for himself, are met with in the later stages of enteric, or long-continued fevers.

Expression and Appearance. These are often very indicative of the complaint from which a patient is suffering. Observe whether he is heavy or restless, or has an anxious and wide-awake look, or is tremulous, whether he is flushed or pale. Any sudden onset of pallor in cases of enteric fever and gastric ulcer should be watched for and reported at once, as this may mean an attack of internal hæmorrhage.

In all cases of difficulty of breathing, whether due to lung trouble or heart, the edges of the ears, cheeks, and lips will be of a bluish tint ; any rapid increase of this should be noted, also whether there is much dilatation of the nostrils combined with restlessness.

Discolorations, scars, swellings, bruises, &c., in fact

anything abnormal, can easily be observed and made a note of, while washing the patient, without unduly attracting his attention.

Pain. This is always an indication that something is wrong. The extent of pain, locality, and duration should be noted, as also its character; whether dull and constant, sharp shooting, occurring in paroxysms, &c. An increase in the pulse-rate and the respirations during an attack enables one to judge of the severity of the pain.

Skin. Whether normal, dry, or moist. Profuse perspiration, either in fever or any other disease, such as phthisis, should be reported, and the time of its occurrence noted.

Ears. Whether there is any pain or discharge. Deafness and ringing in the ears often follow the administration of certain drugs. In head injuries the escape of any blood or clear fluid from the ears should be watched for; when a discharge is present, tenderness and pain in the bone behind the ear may occur. It should always be reported.

Eyes. Any features other than normal should be remarked, such as sensitiveness, or the reverse, to light. Any irregularity in the size of the pupil, or a tendency to squint, even though only occasional, also redness of the conjunctivæ or lids, increased lachrymation discharge, or pain.

Nose. There may be profuse discharge from the nose as in cases of nasal diphtheria. A tendency to snore, indicating some obstruction as in adenoids. Dilation of the nostrils, as when the breathing is difficult, such as is the case in pneumonia.

Lips and Mouth. Whether the former are moist, dry, or cracked, as in long-continued fevers; the teeth covered with crusts, or foul, as in enteric; the latter condition requiring constant attention to prevent its recurrence. Ulcers may form on or round the lips; the gums may be spongy, as after the administration of certain drugs; also there may be an increase of saliva.

The Tongue. The manner in which a patient puts out his tongue when asked should be noticed, whether in a straight line or inclined to one side as in cases of partial paralysis. Also whether it is dry, moist, or furred, and the nature, colour, and extent of the fur on it.

Temperature. This should be accurately noted by means of the clinical thermometer at the regular periods stated by the doctor, and in no case should the patient be allowed to place the thermometer in position himself.

The method of taking the temperature has been already described in Chapter III. p. 27. After use the thermometer should be well washed, and on all occasions when not in use kept in a small tumbler of carbolic 1 in 20, containing a small piece of cotton-wool at the bottom ; this is a preventive against possible breakage. Whether the temperature is taken in the mouth or armpit, in no case should these parts be exposed for dressing or washing for quite half an hour previously.

Pulse. The pulse is usually taken at the wrist by placing two or three fingers on the artery there, and it requires some experience on the part of the nurse before she is able to recognise its peculiar features. The arm should not be bent at the elbow when taking it, and if possible it should be taken without the knowledge of the patient, preferably when he is asleep. Another place for taking the pulse is the temporal artery in front of the ear. If the pulse is difficult to take at the wrist the nurse might count the patient's heart-beats by placing her hand on the chest just below and internal to the left nipple. The points to be noted are its frequency, size, compressibility, and regularity. Further information about the pulse is given on p. 25 of Chapter III.

Respiration. The character and frequency of the respiration must be noted. If possible the respirations should be taken without the knowledge of the patient, i.e., when he is asleep, or otherwise immediately after the pulse, by continuing to keep the hand on the wrist and at the same time noting the movements of his chest. By character is meant whether the respirations are noisy or quiet, shallow or deep, regular or irregular.

Stools. Their frequency and general character should be observed, i.e., their colour, consistency, size, whether normal or containing blood, pus or mucus, or undigested food, and whether the patient experiences any pain in passing them. If containing blood, whether the blood is bright or resembling tar. If mucus, whether the mucus is mixed up in the stool or deposited on the top. The colour is often very characteristic of certain diseases, and the shape of the stool should also be marked, whether normal or ribbon-like, as is sometimes the case in stricture of the intestine. If in any way unusual it should be kept for the doctor's inspection without the admixture of any disinfectant, unless otherwise ordered.

Urine. The points to be observed in connection with this are frequency, quantity, colour, smell, and deposit, also if the

patient experiences any pain in passing it. The usual quantity passed is about $2\frac{1}{2}$ pints in twenty-four hours this amount is increased during the cold weather and in some diseases, and when much fluid is taken. Any particular diversion from the normal should be reported to the doctor and a specimen kept for his inspection.

There may be suppression of urine, a most serious symptom ; or retention, *i.e.*, inability on the patient's part to pass urine, which is retained in the bladder, greatly distending it ; and incontinence, *i.e.*, inability to retain the urine in the bladder. All these conditions require immediate treatment, and the first signs of their onset should not go unobserved by the nurse, who in all cases of bladder trouble should carefully measure the urine.

The temperature, pulse, respiration, urine, and stools of a patient should be carefully noted on the temperature chart, which should be a twice-daily or four-hourly one.

Vomit. The time of the occurrence of this is most important, whether immediately after food, or how long after it, and whether preceded by flatulence or pain. The quantity should also be noted, also its characteristics, whether containing undigested matter or blood. If the latter, whether it is bright in appearance or like 'coffee-grounds.' This kind of vomit requires to be reported at once to the doctor, all food by mouth, and even water, being discontinued meanwhile by the nurse till further orders.

Appetite. Another point for observation. A record should be kept of the amount of food taken in the twenty-four hours, and whether the patient takes his food willingly or not. If there is any inclination to flatulence, retching, or pain after it. What food he most relishes and whether he appears to be digesting it or not, judging by the appearance of his stools. Food should be given at regular intervals and in quantities as prescribed, and not just whenever the patient asks for it.

Cough and Expectoration. The varieties of cough should be noted, whether dry, moist, frequent, or occasional, and whether accompanied or not by expectoration. Whether occurring in paroxysms, ending perhaps in vomiting, as in whooping-cough, and the possible causes for its occurrence ; also whether the patient experiences much pain when coughing.

The expectoration should be kept for the doctor's examination, the quantity noted in the twenty-four hours, and the difficulty or otherwise with which it is ejected. Its colour and

consistency varies with different diseases. It may be white, frothy, opaque, thick and yellow, sticky, plum coloured, &c., and very offensive.

Sleep. The extent and nature of sleep must be observed, whether long continued or occurring in snatches, quiet or restless, or delirious. If the last, whether the delirium is low and muttering, as often happens in enteric, or inclined to be noisy.

Paralysis and Loss of Speech. Both these may occur in the presence of the nurse, who should watch for these symptoms in all cases where they are to be expected. The extent of the paralysis should be noted, whether partial, affecting only certain limbs, or complete.

Loss of speech may be complete, or the patient may be able to say certain words, or he may substitute wrong words, thinking he is speaking correctly.

Weight. In all cases of wasting diseases, such as phthisis and cancer, the weight of a patient should be taken. If a patient is ordered to be weighed weekly, or even daily, care should be taken that he is weighed at the same hour on each occasion and in the same clothes, and his weight registered on the temperature chart.

The Nursing of Helpless Patients

The object in nursing helpless patients is to save their strength as far as possible. They should not be permitted to do anything for themselves, nor excite themselves in any way; hence in serious cases it is advisable that none but the nurse should be admitted into the room. Though an unceasing watch may be required, it need not be made unnecessarily evident, nothing being more objectionable to many nervous people than the constant close proximity of the nurse; when not actually engaged in her duties it would be better for her to sit in the room behind a screen or somewhere where she can see the patient, yet not be seen by him. Unnecessary sympathising questions should be avoided, as also walking on tip-toe, and whispering. A very ill patient should never be waked to take medicine, and the hours for his food during the night should be at longer intervals than during the day. Much is left to the discretion of the private nurse, but when she is in doubt as to what to do she ought to get definite instructions from the doctor. When patients are weak and have been in bed for a long time, there is a tendency to faint when they are

raised into an erect position. They should therefore be removed from the horizontal position by slow degrees.

Night-clothes. For men the pyjama coat, turned back to front, will be found the most convenient article of apparel as being easy to remove and replace. For women who are very helpless, or exhausted, or difficult to move in any way, it is much better to invest in a few cheap night-gowns and slit them down the front, putting them on back to front. In hospitals all these conveniences in the matter of clothes and nursing appliances are ready to hand, but in private houses there is a constant demand made on the ingenuity of the nurse. As has been said, everything must be done to husband the strength of the patient, and nothing is more exhausting to a helpless case than the putting on and removal of the ordinary night-gown.

Washing and Bedmaking

This should be done about half an hour after food and got through as quickly as possible. The morning wash, being usually the longer and more fatiguing, is often dreaded by the helpless and very weak. In such cases, when the patient is on brandy, it is advisable for the nurse to give him his first dose of it for the day as soon as this washing is over. A bed bath is given with the patient lying between blankets in bed, in the case of an adult, or on the lap in the case of a small child.

The articles required are two warmed bath blankets (sheets may be substituted for these in the hot weather), soap and two flannels, hot water, a face towel, a large bath towel, dusting powder, methylated spirits or Eau-de-Cologne, and a hot water bottle for the feet.

Wash and dry the face first, keeping a flannel for this purpose. The arms and hands are next washed, only exposing one at a time if the weather is at all cold. If at all possible, the patient should be allowed to put his hands into the water. The chest and abdomen are next washed and dried with as little exposure as possible, and dusting powder applied, and the upper blanket replaced.

The legs and feet are now washed and dried one at a time.

The patient is then turned on to his left side and his back washed. If he is likely to be in bed for some time great care must be taken to prevent bed sores, and all creases of the skin must be well powdered (see p. 569).

Advantage should be taken of his being in this position to remove the lower bath blanket and to change the under sheet and draw sheet.

The former should be rolled up along its length and placed close up against his back, as he is on his left side, the clean bottom sheet meanwhile being rolled up in a similar manner, but to half its width, and placed close beside it, the edges of the unrolled half being tucked under the unoccupied side of the mattress. If the draw sheet is required to be changed, this should be done at the same time. A draw sheet is simply an ordinary sheet folded in half, along its length. It is rolled up afterwards in exactly the same manner as the bottom sheet, the rolled-up end being next the patient, and the free end under the mattress. In putting in a draw sheet care should be taken that the upper edge of it is well under the pillows, otherwise there is every possibility of it being rucked, and drawn down, especially if the patient is capable of sitting up in bed. Having got the bottom and draw sheets as described, the patient is turned over on his right side, and the rolled-up portion of both unrolled and tucked under the mattress on the opposite side of the bed. When in this position on his right side, the opportunity should be taken to wash his left hip and side. Should the top sheet need changing, the clean sheet is spread over the dirty one, the latter being withdrawn from under it without exposing the patient.

The blanket and quilt are then replaced.

Another method of changing the bottom sheet of a patient especially useful in cases of fracture of the lower limbs, when it would be inadvisable to turn him from side to side, is from below or vice versa, the procedure being exactly the same as has already been described.

Mackintosh. All patients who have to be nursed for any length of time in bed should have a short mackintosh spread under the draw sheet. Both these should be kept absolutely without wrinkles, as otherwise bedsores might result. In paralytic cases, or in enteric, or when there is any incontinence of urine or fæces, the mattress should be further protected by a long mackintosh under the bottom sheet, extending from under the pillow to the end of the mattress.

The Mouth and Teeth. These in helpless patients need constant attention, especially in cases of long-continued fever, gastric trouble, or in enteric. A tooth-brush with the bristles firm and not liable to fall out will be found the most efficient,

or otherwise a swab of cotton-wool at the end of a splinter of wood such as goes to compose the ordinary sweeper's broom in India can be used. Borax and glycerine, lime-juice and glycerine, or a solution of listerine on the brush are all invaluable for removing the fur from the teeth and tongue. A feeding-cup in place of a tumbler for gargling purposes should be used for helpless cases who lie on their back, and a small bowl, if available, or the bottom of a soap-dish or nail-brush dish to gargle into. The feeding-cup for the mouth-wash should be kept apart for that purpose, as the smell of any disinfectant has a tendency to cling to it.

The Hair. The easiest and most comfortable way of doing a woman's hair is to part it down the middle and plait it into two plaits. Needless to say the comb and brush should be kept scrupulously clean.

Washing the Hair in Bed. This is easily done with a little practice. A low pillow may be kept under the head during the process, if the patient is uncomfortable without it. Protect it with a mackintosh, over which place a folded blanket and bath-towel, closely tucking the lower edges of these round the neck in order to prevent the night-gown from getting wet. After having soaped the hair well, remove the pillow, and carefully place the basin of water under the head, which should be supported meanwhile with the left hand. Then use a sponge for rinsing purposes. After the basin is removed the head lies on the bath-towel and the hair is dried as quickly as possible.

Heads that are lousy or contain nits require constant attention. If very bad, it is best to apply a carbolic cap, by which is meant a circular piece of lint sufficient to cover the whole head, with a runner round the edges of it, to make it fit closely. This is soaked in carbolic 1 in 20 and applied overnight, the hair having been previously well rubbed with the lotion. By next morning many of the lice will be found to be dead. In every such case, the hair should be combed night and morning with a fine-tooth comb dipped each time it is used in carbolic 1 in 20, to which a few drops of tincture of iodine have been added. This is the best way of getting rid of the nits. (*See also Chapter X, p. 387.*)

The Eyes. Boric lotion (Prescription No. 93) will be found most useful for any affection of the eyes, such as redness or irritation, caused by sleeping with the eyes half open, which

will sometimes be the case when a patient is very weak and exhausted.

The Ears and Nostrils. These must not be forgotten in the daily wash. They are matter of no great difficulty in adults. With children the safest way is to roll a small piece of lint or cotton wool in the shape of a stick and moisten with warm boric lotion.

The Moving in Bed of Helpless and Very Stout Patients. This is often a matter of much difficulty. A pulley at the head of the bed is a great help, but is not often met with in private practice. In its absence the best way to lift a helpless patient up in bed is to place the draw sheet somewhat low down under his buttocks. He is then told to raise his head, cross his arms over his chest, and with his knees drawn up to place his heels just below the lower edge of the draw sheet. In this position it is quite easy for two people on opposite sides of the bed to lift him up into the desired position. When required to keep him in a sitting posture, support his back with pillows, if a back-rest is not available, and place a bolster or a large pillow rolled up in a sheet under his knees, the free ends of the sheet being tied round with a long piece of bandage to the head of the bed. This will prevent the patient from slipping down. In every case where a pillow or bolster is used in this way, it should be seen that it is well protected by being put under the mackintosh or by having another piece of mackintosh rolled round it under the sheet in which it is tied.

Feeding the Patient.

As has been said before, all food during illness should be given at regular intervals and in stated quantities, both to be determined by the doctor, and a careful account kept by the nurse of the amount taken by the patient during the twenty-four hours. A feed of 5 ounces in all is the quantity which an adult as a rule can comfortably take every two or three hours. During the night he should be fed at longer intervals, say every four hours, but much depends on his condition, and definite instruction should be obtained from the doctor about rousing him from sleep for his food.

All sick patients unable to sit up should be fed from a feeding-cup and slowly, the head being slightly raised meanwhile by placing the left hand under the pillow, while a table-napkin is kept under his chin.

When there is difficulty in swallowing, as after operations on the tongue, it will be necessary to attach a few inches of rubber tubing to the spout of the feeding-cup. The end of the tubing is then introduced far back at the side of the mouth, and the food poured in in small quantities at a time, the act of swallowing taking place almost involuntarily. This method should be adopted also in partially unconscious cases, when much care should be exercised in feeding, so as to avoid a fit of choking or coughing. A patient will often object to a feeding-cup; in these instances a bent glass tube or a piece of rubber tubing or a quill (such as is provided in restaurants for iced drinks) placed in the tumbler containing the feed, will be found an efficient substitute.

When possible no food should be kept in the patient's room, nor milk left uncovered on the table beside him until he feels inclined to drink it.

In convalescence the appetite is often very capricious, and the nurse has to exercise much ingenuity in getting the patient to take his food. Extreme cleanliness and daintiness in serving it must be observed, the sight of a large quantity of food often nauseating a patient with a delicate appetite. See that the plates are hot, and that his tray is provided with everything necessary before carrying it into his room, and do not let him wait for first one thing and then another. If the nurse finds it necessary to taste his food first, she should not do so in his presence, and certainly not with the same spoon she is going to offer him. She should do her best to vary the dishes as much as possible, but always in strict accordance with the doctor's orders, explaining to the patient the risks he runs if those orders are disobeyed.

Water and Ice. The former is as a rule given freely so long as it is seen that it does not interfere with his feeds, a patient very often after large and frequent draughts of water being naturally disinclined to take anything more nourishing.

Ice in small quantities is very useful for preventing vomiting after a feed, or vomiting after an anæsthetic, though in the latter case drinks of about 8 ounces at a time of hot water containing 10 grains of soda bicarbonate repeated every half-hour or hour, are often ordered by the surgeon. The patient as a rule vomits immediately after it and is relieved.

The best way of preventing crushed ice from melting too quickly is to keep the chips on a piece of flannel stretched over the mouth of a tumbler or cup; while a hatpin or cap-pin, or a

large darning needle, will be found useful in chipping ice, this method causing little waste besides being practically noiseless.

Medicines. Medicines to be given by mouth should be kept apart from those for outward application only, such as liniments and lotions, which moreover should be kept in special bottles and be labelled 'poison.' These are very important precautions to observe to avoid catastrophes, especially in amateur nursing.

Whether in the form of draughts, pills or powders, the medicines should, after a careful reading of the directions, be given at the times stated and in the quantities ordered. When required to be measured, a graduated medicine glass should be used, as table-spoons and teaspoons are very inadequate substitutes. Unless expressly stated to be given immediately before or after food, the times for giving medicine should be so arranged as to not too closely follow nourishment, especially when there is an inclination to vomiting. A slice of lemon or orange or a pinch of salt will be welcome after a nasty-tasting dose, especially in the case of codliver oil and castor oil. The least objectionable way of giving the latter is to squeeze a few drops of lemon juice into the medicine glass add to this a teaspoonful of brandy, then pour in the castor oil, letting it float on the surface of the lemon juice and brandy, the same quantities of which should cover it on the top. The whole should be taken down quickly, not sipped, and a slice of lemon sucked afterwards. In cold weather the medicine glass should be set in a cup of warm water so as to render the oil more fluid and to prevent it sticking to the sides of the glass. Pills, tablets, and powders are placed on the tongue and swallowed down with a draught of water. The first two in India either become like bullets when they are to be crushed, or deliquesce into a sticky mass. The pleasantest way of taking powders is in a cachet or gelatine capsule such as supplied by some druggist firms. When neither is forthcoming, and the powder will not dissolve readily in water and has a tendency to cling to the mouth, it might be mixed in a teaspoon with a little glycerine. This way of giving powders is recommended in the case of children and unconscious people.

The private nurse should always ascertain whether a medicine is to be repeated as formerly, or altered in any way, also she ought to be conversant with the effects of certain drugs, observing carefully any bad effects from the medicine admi-

nistered ; for instance, nausea, vomiting, diarrhoea, headache, &c., and not failing to report her observations to the doctor.

Stimulants. These may be given in the form of brandy, whisky, rum, or, on occasions, strong coffee.

They are prescribed for the purpose of stimulating the patient, and should not be too freely diluted with water, one to two parts of water for an adult being usually the right mixture, therefore, when brandy is ordered it should not as a rule be added to a feeder full of milk, or given directly after a feed of milk, as its stimulating effects would thereby be lost. When a certain quantity of stimulant is prescribed for the twenty-four hours, it should be so portioned out as to be given at regular intervals, care being taken that the patient does not have to do entirely without it during the night, when his strength is often at its lowest.

In cases of sudden collapse, brandy mixed with hot water will be found to be more effective than if mixed with cold water.

The Use of Bedpans.

As the aim and object in nursing is to save the strength of the patient as far as possible, it is necessary in all cases where he is unable to get out of bed without unduly tiring himself, that the nurse should insist on the use of the bedpan. This is sometimes a matter of difficulty, but with a little patience and insistence, the patient can soon be got to use it. Bedpans are either of the slipper shape or a newer and more suitable type called the "Perfection". In cases when a patient is able to help himself a little he should be told to draw his knees up in bed, supporting himself on his heels and elbows. In this position he can raise himself up sufficiently to allow of the bedpan being placed under him. In helpless cases, the nurse will have to have assistance in raising him. Should he be very thin, a pad of wool or folded linen placed over the thin end of the pan will make him more comfortable. All dragging away of the bedpan when removing it should be avoided, as liable to produce bedsores. In cold weather the pan should be heated by being immersed for a moment in hot water before being offered to the patient, and in cases of excessive perspiration, as a further precaution against bedsores, it is advisable slightly to oil the portion that will be in contact with the patient. He should never be allowed to remain on it longer than is absolutely necessary.

Air and Water Beds and Cushions

These are very necessary for relieving pressure, and thus preventing bedsores, in cases of long-continued illness, or when there is incontinence of fæces or urine, or when the patient is very thin.

They are both expensive items in private nursing, especially in India, as the rubber is liable to perish. When full sized, which is the most desirable for paralytic cases, they extend over the whole length of the bed.

A full-sized water bed is necessarily heavier than the same sized air bed, but is generally considered to be more comfortable by the patient. It should be filled about half full with lukewarm water. If filled too full the patient is apt to roll off it.

Both air and water beds should be placed on the mattress and covered with a blanket over which is placed the bed-sheet. If instead of being made of rubber they consist of waterproof canvas, a long mackintosh over the blanket will be necessary as a protection, as this kind of bed is very difficult to clean when once it has got soiled. A convenient substitute for a full-sized water bed is an oblong rubber pillow about 3 feet by 2 feet to contain either air or water: this can be placed immediately under the buttocks, where relief from pressure is most needed.



FIG. 46. Air Cushion.

A water pillow of this size should be filled just sufficiently full to allow of the two sides lightly touching each other when the hand is placed in the middle of it. Circular air-cushions are also most useful, and in India more easily obtained than any of the above. These, as well as the small-sized water bed, should never be placed directly against the patient, but under the draw sheet, not only because the contact with the rubber would be found to be hot and disagreeable, but also for reasons of cleanliness. All water beds when not in use should be kept partly filled with water to prevent their perishing.

Special Nursing Points in some Diseases.

Enteric or Typhoid Fever. Enteric fever makes the most demands on the capabilities and patience of a nurse, even though it may happen to be only a mild attack; for in every case the same precaution as regards feeding and gentle handling must be observed in view of possible complications, such as hæmorrhage, or perforation of the intestines.

To begin with, every care should be taken by the nurse to prevent the spread of infection. All utensils, such as feeding-cups, bedpans, urinals, &c., should be kept rigidly apart for the patient's sole use, and should after the termination of the illness be boiled. The patient's linen, such as sheets, night-gowns, &c., should be kept saturated in a bath of some disinfectant, such as 1 in 40 carbolic, for twenty-four hours, before being sent to the wash, as the source of infection lies in the discharges from the bowels and the urine. All soiled linen must, therefore, be soaked in the disinfectant before being washed. No soiled sheets should be left under the patient longer than is absolutely necessary, and the tow or linen used for receiving the discharges of a typhoid patient should be burnt. Before disposing of the excreta from the bedpan or urinal, disinfectant should be added. This should be done immediately after use unless the contents are required for inspection.

The nurse should observe scrupulous cleanliness after attending to an enteric patient, being careful to wash her hands with soap and water (using a nailbrush) every time after removal of the bed-pan and should also dip her hands in a bowl of disinfectant such as carbolic 1 in 20, or biniodide 1 in 2000. She should never sit down to meals with unwashed hands.

Further instructions about disinfection will be found in Chapter XXII.

The Bed and Daily Washing. The patient's bed should be protected with a long as well as a short mackintosh, and bed-sores guarded against by the use of an air cushion or water pillow. The clothing should be light and warm, and a hot-water bottle placed at the feet if required.

The morning and evening wash are indispensable, the first for reasons of cleanliness, the second usually as a sedative to produce sleep. The washing should be done as quickly as possible so as not to fatigue the patient, special attention being paid to the mouth, which should be well cleansed with borax

and glycerine, all crusts being removed as far as possible from the teeth and tongue. To prevent their reforming, it is necessary that before and after every feed the mouth should be rinsed out with some water out of a feeding-cup.

The back needs special attention to prevent the formation of bedsores (*see* p. 569). For this reason also, as well as to prevent the possibility of a severe attack of bronchitis, a change of position is very necessary, it being usual in all cases of typhoid to turn the patient from side to side every two hours. This is most essential in the later stages of the disease, when the patient is apt to lie listless on his back taking notice of nothing. A condition of perfect rest is essential for a typhoid patient, so in no case should the change of position be effected by himself. He should be rolled over gently, a pillow being placed behind him and another between his knees, when lying on his side; when on his back, a pillow should always be kept under his knees in order to relax the abdominal muscles. He should also not be allowed to lift himself on and off the bedpan.

The temperature, pulse, and respiration should be taken four-hourly, and noted on the chart along with the stools and amount of urine passed in the twenty-four hours. The form of bed-side report already mentioned will be found most useful, as it is necessary for the nurse to keep a detailed daily account of the patient's symptoms and progress for the doctor's inspection.

Spots. These may be seen either isolated or in the form of a rash on the abdomen, chest, or back. They are of rose colour, rounded, sometimes slightly elevated, and fade on pressure, returning when the pressure is removed. The nurse should watch for them between the seventh and twelfth days of the illness, as sometimes they are very faint and fade quickly.

Stools. Ordinarily the stools are of a pea-soup colour; but they should be carefully inspected for signs of hæmorrhage, which might take place in the third week, when the appearance of sloughs or dark bits of skin streaked or edged round with red will be observed to make their appearance in them. The hæmorrhage may be so slight as to be hardly noticed in the stool, and it may not have any bad effect upon the patient, or it might be copious, of a bright red colour, calling for instant attention. A severe attack would be preceded by excessive pallor, a sudden fall of temperature, and a quickened pulse. In this case, in the absence of the doctor, should the nurse not have got definite directions from him how to act, she should

apply an ice-cap over the patient's abdomen and stop all food by mouth, keeping him lying flat on his back and perfectly still, his head lowered and the foot of the bed raised on blocks.

Any undue abdominal distension, with inability to pass flatus, should also be watched for, as it might lead, in the later stages, to perforation of the intestines. This too would be indicated by a rapidly rising and small pulse and a sudden drop in the temperature. In either perforation or hæmorrhage the treatment should be the same till the doctor arrives, the usual enema either daily or every other day being immediately discontinued, and the patient only allowed to use a pad under him instead of being lifted on to the bedpan.

Feeding. The food, which will be liquid, should be carefully strained. It should be given at regular intervals and in the quantity ordered. As sleep is so beneficial to the patient, he should not be disturbed for his feeds, but the nurse must be careful not to mistake stupor and extreme prostration, which sometimes occur in the later stages of the disease, for natural sleep. In these cases the patient must be roused for food.

The Convalescent Stage. This is usually very tedious, but all the above precautions as regards feeding, moving, disinfection, &c., should be rigidly adhered to till otherwise ordered. The patient develops a very good appetite, but he should not be allowed to overeat; and when he is once put on solid food, care should be taken that he is given nothing in the way of hard crusts of bread, dry toast, &c., till permission has first been obtained.

Pneumonia. The nursing points to be observed in pneumonia are free ventilation of the room and absolute rest, both mental and physical, the chief danger being heart failure. Most adult patients should be allowed to choose the position they are most comfortable in, a great many preferring to be propped up in bed with pillows; whatever the position, a change in posture, such as being turned from side to side, is most necessary.

The clothes should be warm but light, in order that the respiration might be impeded as little as possible; hence the patient is often ordered to wear what is called a pneumonia-jacket made of gamgee, or a layer of cotton-wool between two folds of gauze. This covers the front and back of his chest, fastening with tapes at one side and on each shoulder, which makes it easy to remove. The gown will for the same reason be turned back to front. Sponging should be twice daily with

hot water to induce the skin to act. The mouth needs constant attention, as it is always parched and dry. Food must be given in a feeding-cup in small quantities and frequently, remembering that a hot drink is more soothing for the cough than a cold one.

Note the quantity and the character of the sputum, and if poultices are ordered for the pain on the chest, see that they are put on quickly with as little disturbance to the patient as possible.

The temperature is taken four-hourly. In cases of hyperpyrexia cold sponging may be ordered, when a strict watch must be kept on the pulse, any weakness of its force calling for an immediate removal of the pack; also with a very high temperature, especially in alcoholic patients, delirium might be looked for. If he becomes very violent, do not exhaust his strength by trying to battle with him. To prevent him getting out of bed put the bed against the wall, or protect each side of it with four or six bamboos tied to the curtain-poles. These will be found much more convenient than backs of chairs.

Pulse and Respiration. The latter being out of proportion to the former, any steady rise in the pulse-rate, accompanied with difficult breathing and increased lividity of the edges of the ears, nostrils, lips, finger-nails, must be reported at once, as these may be the first symptoms of impending heart failure. If inhalations of oxygen are ordered, see that the cylinder is unscrewed and set going, away from the patient, and do not, until this is done and the flow of the oxygen properly regulated, attempt to attach the tubing and funnel through which the patient receives it to the nozzle of the cylinder, for if the latter is unscrewed too much the rush of oxygen will smash the funnel and tubing to pieces and terrify the patient (see also p. 501).

The nurse should watch for the first signs of the approaching crisis and prepare for it by having stimulants such as brandy, strychnine, &c., ready at hand, for it is a period of great prostration for the patient, especially when the temperature drops suddenly to normal. Perspiration should be encouraged by means of hot blankets and bottles and hot drinks. His clothes should not be changed until he has quite ceased to perspire, when every precaution against his catching cold must be taken.

Pneumonia is not a long and fatiguing disease such as typhoid to nurse, but it often gives grave cause for anxiety,

especially in the case of alcoholic people, in the young or very aged, and in those suffering from heart and kidney disease.

Phthisis. In this disease plenty of fresh air and sunshine are essential, and the keeping up of the patient's strength with nourishing food. An open-air existence is generally ordered, though he may be confined to his bed, but in cases where this is not possible, the nurse should see that his room is bright and sunny, with many open windows. These instructions must be modified in India during the hot weather. No upholstered furniture or curtains should be allowed in the room unless covered with removable washable covers, nor are hangings desirable. The bed should be placed not at one side, but in the middle of it, to allow the air to circulate round it freely. As dust is so irritating to a consumptive patient, damp tea-leaves should be used freely for sweeping the floor with, and a damp duster for the removal of the dust from the furniture, &c.; the latter as well as all floor brushes should be soaked daily in carbolic 1 in 20 after use.

The clothing must be light but warm, flannel next to the skin being advised, as night sweats are very frequent; when these occur the patient should not be left in his damp clothes but wiped dry and redressed.

The appetite is often capricious, dyspepsia sometimes being a troublesome feature; but the nurse should do her best to tempt him in every way to eat. Hot drinks are useful when the cough is very troublesome.

Bathing and Washing. Unless he is confined to bed, in which case he must be washed in the usual way, bathing is generally allowed, every precaution against his catching cold being taken. If in the previous twenty-four hours there has been the slightest streak of blood in his sputum, the bath should be discontinued till further orders. In bedridden cases who are very thin the back needs special attention.

The temperature, pulse, and respiration of the patient, if there is much fever, are taken every four hours or at particularly stated hours. They should be charted on the chart, along with the weight, which is another point for care. A patient should be weighed in the same amount of clothes, at the same hour on each occasion, on the same machine, and if possible by the same nurse.

When hæmoptysis is anticipated, the nurse should get instructions from the doctor how to proceed and have everything in readiness, for even a slight attack may be a precursor

of the second and fatal one. The discontinuance of all drinks by mouth and rest in bed are the first essentials in these cases, the patient being allowed to choose his own position, as the recumbent one does not always give the greatest relief, sometimes bringing on more coughing and another attack of hæmorrhage. She should try her best to allay his fears about himself, so as to prevent mental excitement, and if the remedies ordered by the doctor fail to have effect she should send to him at once. In cases of sudden collapse hot-water bottles should be in readiness. When patients are on tuberculin treatment the nurse must note the effect of the injection on each occasion, and report symptoms of headache, giddiness, pain and constriction in the chest, &c., also if the site of the injection becomes very swollen or red.

Precautions against the spread of the disease are very much in the hands of the nurse; she must also caution patients against what habits to avoid, such as the tasting of the baby's food with the same spoon by consumptive mothers and trying the teat of the bottle. Kissing should be avoided as being dangerous, also such habits as sucking the tips of pencils and pens, as these might be used by some one else. Sputum-cups must contain some strong disinfectant such as carbolic 1 in 20, and, their contents burnt, the cups themselves, as well as all feeding utensils, should be subjected to a daily boiling.

All handkerchiefs or clothes used to receive the discharges of the patient should preferably be burnt, but if this is not possible they should be well boiled before being sent to the laundry (see also Chap. VI).

When attending to a patient, the nurse must not place herself in such a position where she is likely to receive the discharges from his mouth in an attack of coughing.

Rheumatic Fever or Acute Rheumatism. The chief point in the nursing of this disease is to keep the patient warm, as rheumatism is usually the result of exposure to cold and damp, some people showing a greater tendency to be affected in this manner than others. The patient should not be allowed out of bed, and should be clothed in light flannel and lie between blankets except in the hot weather. The joints, either the ankles, knees, elbows or wrists, become swollen and painful, and should be wrapped round with cotton-wool and flannel or thermogene wool and the pressure of the bed-clothes taken off them. The temperature is raised and the urine often scanty and containing much deposit;

the nurse should measure the urine.

Feeding is most important, so in the absence of the doctor the safest course for her to pursue is to keep the patient on milk diet only, rigidly avoiding all meat essences and stimulants and giving him copious draughts of barley-water flavoured with lemon in order to assist the flow of urine.

As one of the favourite remedies for rheumatic fever is salicylic acid, the nurse should be acquainted with its possible effects, some patients being unable to tolerate the drug for a lengthened period. It is always depressing; there may be noises in the ears with deafness and giddiness; also headache, stupor, and delirium sometimes supervene, and there may be blood in the urine.

Any one of these symptoms must be watched for and reported; the grave ones may come on very suddenly and will require an immediate discontinuance of the drug. On no account when the temperature reaches normal should the patient be allowed to sit up or get out of bed until permission has been obtained. A convalescent from rheumatism should be warned to wear warm light flannel clothing always, and avoid as far as possible a recurrence of the disease.

Diarrhœa and Dysentery. In both these cases the patient should not be allowed out of bed. The diet and treatment will be ordered by the doctor, and must be rigidly adhered to. Long-continued diarrhœa often results in soreness of the anus, which can be relieved with a little boracic ointment.

One stool daily should be kept for the doctor's inspection, and the bedpan reserved for the patient's sole use. Precautions similar to those in enteric should be taken to disinfect dysenteric stools.

Kidney Diseases. In these cases warmth is essential, also a rigid adherence to the diet prescribed. The urine must be carefully measured, its characteristics noted, and a daily specimen put up for the doctor's inspection unless otherwise ordered. Any inclination to complete suppression is to be reported at once. Swelling of the legs, also any giddiness, shortness of breath and convulsions, should be watched for.

As perspiration should be encouraged, the morning and evening sponging should be with warm water. Vapour and warm baths may be ordered. A tendency to constipation should not be passed unnoticed. Barley-water in copious drinks is usually ordered, but alcohol and meat essences must be avoided unless especially prescribed.

Renal and Gall-stone Collic. For both these, in the absence of the doctor, the only means at the disposal of the nurse for the alleviation of the intense pain is by hot fomentations over the seat of the pain. The patient is generally doubled up with the pain, and perspires profusely. Hot drinks are appreciated. In the former the urine should be measured and kept for inspection, and in the latter the nurse should carefully examine stools for the presence of gall-stones, straining each through muslin. She should also in this case watch for any symptoms of jaundice.

Bed sores and their Prevention. In order to prevent bed-sores care must be taken to see that the undersheet and the drawsheets are smooth, and that there are no crumbs in the bed.

The patient's back must be attended to twice a day and after a motion, particular care being taken to see that the skin is not allowed to remain soiled with the discharges.

The skin is first rubbed briskly with Eau-de-Cologne or Spirit, this is followed by the application of a simple dusting powder (prescription 68). Certain parts require especial attention namely the heels, all bony prominences, and the lower part of the back.

Should the skin begin to appear red, it must be relieved of pressure, either by changing the position of the patient, or by adjusting a rubber air ring or a pillow. In these cases the following dressing is very suitable :

Friars Balsam 1 drachm.

Zinc Oxide to 1 oz.

Smear this ointment thickly on lint and apply to the red area of the skin. It should be changed once a day.

If the skin ulcerates, and becomes septic, a rapidly developing and deep sore appears. In this event the following measures should be adopted.

- (1) Relieve the part of all pressure.
- (2) Keep the surrounding skin meticulously clean.
- (3) Apply hot Eusol dressings three times in the twenty-four hours.
- (4) After the ulcer has cleaned up and shows signs of healing dress the part with the above ointment.

CHAPTER XX

THERAPEUTIC APPLICATIONS, &c.

Application of Cold : Application of Heat : Antiphlogistin, Baths : Bladder Wash-out ; Blisters : Blood-letting : Bronchitis kottle : Female catheter : Climates : Cupping : Enemata or Rectal Injections : Flatus Tube : Hyperæmic Treatment : Inhalations : Injection of Male Urethra : Intravenous Injections : Iodine Paint : Leeches. Massage : Mustard Plaster : Nasal Douche : Nasal Feeding : Rest Cure : Sprays : Turpentine Stupe, Transfusion Vaccines and Tuberculin : Vaginal Douches : Washing out the Stomach.

The Application of Cold. Cold may be applied either A, locally, or B, generally.

A. Cold is employed locally in recent injuries to diminish the amount of swelling likely to ensue, or in acute inflammation to relieve the pain, or in some diseases to relieve local pain or congestion, such as a cold compress to the head in violent headache and delirium.

In the first class of cases it may be difficult to determine whether cold or heat should be applied. A good general rule for a bad sprain is to apply cold for the first twenty-four hours. This will help to limit the amount of effusion. After that period the object is to absorb what effusion has already occurred, and for this purpose heat should be applied. For inflammations as a rule heat, not cold, should be applied, as this is evidently Nature's remedy, and we are assisting Nature in making the part hotter. Sometimes, however, the patient cannot stand more heat, as on an inflamed knee-joint, and then cooling applications will be best. In this matter the sensations of the patient may be consulted, as they are generally a safe guide. The local application of cold may be effected by the following means :

(1) *Evaporating Lotions.* These are used for the purpose of keeping the affected part cool, thereby reducing inflammation. A piece of mackintosh should be placed under the part to be treated on which a piece of lint, or cloth, dipped in the evaporating lotion ordered, is placed. The lint should not be covered with a piece of protective, or wool, or even a bandage, but left exposed to the air. Constant renewal is necessary. Pres-

cription No. 17 is a suitable evaporating lotion, or one may be made by mixing 2 ounces of spirits of wine and 2 ounces of vinegar in a pint of cold water ; or iced water alone may be used.

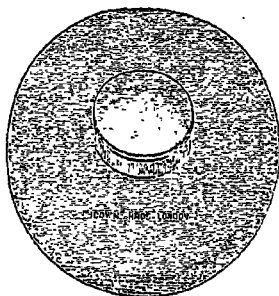


FIG. 47. Ice Cap.

(2) Ice in a Cloth or India-rubber Bag. Rubber ice-cap may be of different shapes, the most usual being round. They should be half-filled with chips of ice, and before the stopper is screwed in, the air should be squeezed out in the same manner as when filling a hot-water bottle otherwise the ice-cap is apt to roll off the spot to which it is applied. The addition of salt intensifies the cold, and saw dust may be used to absorb the moisture caused by the melting of the ice. The ice-cap should be refilled before the last of the ice is melted, and before application should have a piece of lint or cloth tied round it, as the constant drip of moisture is unpleasant to the patient. When a rubber ice-cap is not at hand, use a bladder, a flannel bag, or even a folded handkerchief to hold the ice chips.

(3) A. Coil of Tubing. Rubber and metal coils can be purchased designed to fit the head or other parts of the body where it is desired to apply cold. By a siphon action ice-cold water can be made to circulate through the coil from one pail to another. This is very useful in sunstroke, meningitis, and on other occasions.

B. The application of cold to the whole body may be effected either by (1) sponging, (2) cold packs, (3) cold baths.

(1) Cold Sponging: First Method. Ordinarily by cold sponging is meant the following :

The patient, after having had his clothes removed, is left on a blanket over a long mackintosh, with a sheet or a light blanket covering him, and the sponging is proceeded with in

sections with water gradually reduced in temperature by ice. An ice-bag or wet cloth is kept on his head meanwhile. The sponging should be done in a downward direction, each limb being treated for about five minutes at a time, and then dried and covered up, before the next is proceeded with. Begin with the arms, then sponge the chest and abdomen, afterwards the legs, and finally the back, turning him over on his left side while doing the last.

Cold Sponging: Second Method. As a substitute for a cold bath in cases of hyperpyrexia, when the weather is very hot and a full-sized bath unobtainable, the following way of reducing the temperature will be found useful. It is not what is called cold sponging in the ordinary acceptance of the term.

Having stripped the patient, place him with a towel pinned round his loins on a large mackintosh extending over the whole of the bed and pillow, the end of the mackintosh at the foot of the bed being so folded as to make a tunnel to allow of the flow of the water into a bucket on the floor. To assist this, the head of the bed should be raised by means of a couple of blocks placed on the floor. Place an ice-bag on the patient's head, or better still at the nape of his neck, and quickly sponge him down with a large sponge, or a towel with cold water, gradually reducing its temperature by ice. In all methods of cold sponging, especially if long continued, it is advisable to keep a hot bottle to the patient's feet to guard against collapse. The sponging may be continued for half an hour or longer, according to the condition of the patient. The temperature is taken at intervals, in the mouth, and should not be reduced by more than 3° , as an excessive drop would be liable to produce shock or collapse.

Cold water, barley or lemon drinks may be given during the treatment. Afterwards, the patient may better be left in a wet pack if his condition can stand it, and if the temperature is likely to rise again quickly, or he may be dried and have his clothes put on.

(2) *Cold Packs.* The patient having been stripped, has a towel pinned round his loins, and is left on the bed on a blanket under which should be placed a long mackintosh. An ice-cap or cloth wrung out of iced water should be kept on his head. Two sheets, rolled lengthways, are kept in readiness in a tub of cold water, to which ice, if ordered, may be added. Having turned the patient on his left side, one of the rolled-up sheets after having had the excess moisture wrung out of it by twist-

ing the ends in the opposite directions, is quickly placed under him, the sides being made to overlap and closely fit his limbs, the second sheet is treated in the same manner and placed over the entire length of the front portion of his body. He is then covered with a blanket and left for fifteen or twenty minutes, when the pack may be renewed by means of two other sheets already kept rolled up in the bath, being substituted for those just removed. When it is advisable to disturb the patient as little as possible the sheets, instead of being changed, may from time to time be moistened with a sponge of very cold water, or rubbed over with a lump of ice. In cases of incontinence of urine or feces, it is better to cold-pack a patient by means of towels used instead of sheets, one for each limb and one each for his back and chest, he being kept on a slipper bed-pan all the time, care being taken that he is quite comfortable meanwhile. A pillow placed under the bottom mackintosh and blanket to support his knee will be a help in this.

Cold packs may be continued for hours and even days, any tendency to excessive shivering or collapse being counteracted by means of a hot bottle kept against the feet. The temperature during a cold pack should be taken at intervals in the mouth, and if the patient is delirious and unable to hold the thermometer under his tongue, it may be taken in the rectum. On removal from the pack, he is wiped down, his nightgown put on, and he is covered with a light blanket. A warm drink may then be given and the patient allowed to go to sleep. Rubber hot-water bottles, partially filled with ice-cold water, and placed along the spine, during a cold pack, are of much assistance in reducing the temperature in very hot weather; especially when there is much difficulty in moving the patient, as the sheets under him get hot more speedily than the others.

(3) The cold bath is described on page 581.

The Application of Heat. Like the application of cold the application of heat may be either A, general, or B, local.

The general application of heat is usually for one of three purposes, either (a) to treat collapse by restoring the skin circulation to the patient, or (b) to provoke perspiration and in this way cause the skin to relieve the kidneys of some of their work, or (c) as a nervous sedative; in this way the warmth is useful in delirium and insomnia.

The local application of heat is used to promote an increased flow of blood to the part affected, and to increase the inflammation there. The increased blood-supply tends to the more

rapid cleansing and healing of the part, as well as to the lessening of pain.

A. Heat may be applied generally in the following ways :

(1) *The General Hot Bath.* (See p. 581.)

(2) *The Mustard Bath.* (See p. 581.)

The mustard bath is invaluable for infants collapsed with diarrhoea and vomiting, and for those with convulsions.

(3) *Tepid Sponging.* This is done in the same way as cold sponging, lukewarm water being substituted for cold water. It is generally ordered for the reduction of temperature when cold sponging might prove too great a shock to the patient ; also as a sedative at night to induce sleep.

(4) *Hot Packs (Wet).* These are intended for the purpose of producing perspiration or as a sedative to the nervous system when the patient is delirious. The procedure is the same as for a cold pack, the sheets being wrung out of water at a temperature of about 100° to 112° F. When ordered as a sedative the water should be somewhat cooler. For inducing perspiration the patient is left covered with two blankets, having a mackintosh between them till he has quite ceased to perspire. An ice-bag should be kept on his head, and drinks given during the pack, and afterwards, as they promote the secretion of sweat. For removal from the pack, quickly withdraw the wet sheets. Do not attempt to dry him ; but replace the bottom and top blankets with warm dry ones, the top mackintosh also being taken away, and leave him thus for about a couple of hours.

(5) *Hot Pack (Dry).* Proceed as in hot wet pack, using hot dry blankets instead of sheets.

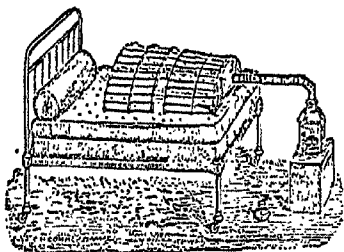


FIG. 48 Allen's vapour Bath.

(6) *Hot-air Bath.* The apparatus required is Allen's, with the boiler portion of it removed. Having placed a blanket under the patient, his clothes are taken off, and a blanket folded lengthways put over him. Then large wicker cradles are placed over him, two or three being sufficient, and these covered with first a blanket, then a mackintosh, and finally a second blanket; the coverings being tucked in closely round his neck and at the sides. The blanket next to him is then removed by inserting the hand under the last cradle at the foot of the bed and drawing it away. The apparatus with spirit lamp will have to be raised to a sufficient height at the foot of the bed, to enable the spout to be inserted just under the last cradle. The box in which it is packed is generally of the right height for this. The spout should have been wrapped round with a piece of wet flannel to prevent the blankets from getting burnt. These must be tucked closely round it to prevent the escape of the hot air during the bath. The patient may have an ice-cap on his head, and is given warm drinks such as barley or lemon water, as these assist in the production of sweat. His pulse and general condition must be watched carefully. If there is any extreme discomfort he should be removed from the bath, otherwise it should be continued till profuse perspiration is produced.

To remove the patient from the bath, take away the lamp, and cover him with a hot blanket folded lengthways which is introduced under the cradles from the bottom upwards. Then remove the cradles one by one by slipping the hands under their coverings and drawing them out. The top blanket and mackintosh then fall upon him, and should closely envelop him, and he is left till he ceases to perspire, when he should be sponged down quickly with warm water and a warm nightgown put on.

Every possibility of a chill afterwards should be guarded against.

Hot air or vapour baths for patients in the sitting position. Sit the patient on a cane-bottom chair over which is placed a blanket, cover him closely round the back with blankets, so arranged that the lower ends of them extend to the floor on all sides of the chair, closely enveloping it. Then introduce the spout of the apparatus under one corner of the blankets, pinning them down round it to prevent the escape of the hot air or vapour.

(7) *Vapour Bath.* For this the most convenient form of

apparatus is Allen's with the addition of the boiler, which is filled with boiling water. In the absence of the above a large-sized kettle or angithi might be used with a tin funnel curved slightly downwards and sufficiently long to be introduced just under the last cradle. The method of administration is the same as for a hot-air bath, except that a long mackintosh should be placed under the blanket on which the patient lies to prevent the bed getting wet. Care should be taken that no moisture drops on him from the end of the funnel. This can be achieved by means of a piece of cotton-wool or flannel being placed over his legs, or a small cup tied on to the end of the funnel to receive the drops. The method of removal from a vapour bath is the same as from a hot-air bath. Similar precautions against the patient catching cold being necessary.

(8) *Hot Bottles.* The application of these requires much care, as burns frequently result, especially in unconscious or paralytic patients, if they are applied without a sufficient amount of covering between them and the patient. They should be put in a flannel bag, and placed so that a piece of the top blanket is between them and the patient. The most convenient form of hot-water bottle is made of rubber, but they may be of tin or earthenware. In filling a rubber bottle, exclude the air. This is done by not filling it completely and then placing the hand over the empty portion and squeezing out the air before the screw is put on. Often the rubber washer round the screw is broken or missing; a piece of thick leather of the required size makes an efficient substitute. Tin hot-water bottles should be filled quite full to prevent them from rusting. All hot-water bottles have a tendency to leak at unsuspected moments. They require frequent changing, which should be done without any disturbance of the patient. Empty whisky, beer, or vinegar bottles may be used, but there is always a danger of these bursting when filled with boiling water. It prolongs the life of a rubber bottle to use a funnel when filling it. Hot bricks wrapped round in flannel may be used as a substitute when nothing else is obtainable.

B. Heat may be applied locally in any of the following ways, each of which has its special application under the circumstances mentioned in the text:

(1) *Fomentations (Wet) for any Portion of the Body where there is not an Open Wound.* Spongiopiline or two or three folds of flannel, lint, wool, or even towelling of the required

size may be used. Place the material wrapped round in a wringer such as a towel, duster, or any piece of cloth, in a bowl. Pour boiling water over it and apply to the part, after having been wrung dry by the ends of the wringer being twisted in opposite directions. Cover with a piece of protective, such as mackintosh, over which is placed a pad of wool, the whole being kept in position with a bandage or binder. If spongipiline is used the protective will not be required as one side of it is of waterproof material.

This kind of fomentation may be repeated at stated intervals every two or four hours according to the size of fomentation. If required to be continued for half an hour or longer at a time, another piece of flannel or whatever material is being used should be kept in readiness in its wringer in another basin, so that there should be no time lost between the application of each fomentation, thus obviating the chance of the patient catching cold. After removal, the part should be well dried and protected from cold by the application of a piece of wool and a bandage.

(2) *Fomentations for Open Wounds.* Lint, linens of several thicknesses, or wool may be used. And as in private houses dry sterilisation is a matter of some difficulty, the material selected may in its wringer be boiled up in boric lotion (Prescription No. 14) or carbolic lotion 1 in 60 (Prescription No. 16 one part, water two parts), in a clean saucepan, to render it aseptic, before being applied. If stained with any sort of discharge, the same fomentation should not again be used. In applying fomentations to open wounds thorough cleanliness of the hands is necessary: they should be washed with soap and water, using a nail-brush, and then immersed for a few minutes in antiseptic lotion. The fomentations are repeated at stated times, and should be covered with a piece of waterproof protective and wool to prevent evaporation.

(3) *Fomentation (Dry).* Bran, sand, or salt may be used for these. They should be well heated in a tin or old saucepan over the fire before being put into a flannel bag of the required size, and then applied to the part. Another bag being kept in readiness to be put on, when the first becomes cold.

Protective is not required for these kinds of fomentations. A thick piece of flannel over the bag will keep the fomentation warm longer.

(4) *Hot Turpentine Stupe.* Required: A bowl, a kettle of boiling water, some turpentine, a piece of lint or flannel of two

thicknesses of the required size, and a towel or duster in which to wrap the flannel. In such case the towel is usually called a wringer.

Sprinkle from 1—2 drachms of turpentine on to the lint or flannel and proceed in the same way as for a wet fomentation. Watch carefully for reddening of the skin; eight to fifteen minutes may be enough.

Turpentine stupes may be applied every four hours, care being taken that the part does not become unduly reddened and that no blisters form. If the skin is very tender, it may be smeared with a little oil or vaseline before the next stupe is applied. On removal a piece of dry cotton-wool is placed over the part.

(5) *Linseed Poultice*. Required: Crushed linseed, a basin previously heated with warm water, in which to mix the meal, a kettle of boiling water, a poultice knife, which is one with a long flexible blade of steel or in its absence, a carving or table knife, some material to spread the poultice on, such as old cloth, lint, or tow. If either the cloth or lint be used, the material should be cut about $1\frac{1}{2}$ inches larger than the size required for the poultice, in order to enable the edges to be neatly folded over the meal. If tow is used, it should be teased out evenly, leaving a margin of about the same depth all round, which is rolled in a spiral over the edge of the poultice after it has been spread on the tow. Any ordinary table may be used for making the poultice on, instead of the usual poultice board, which resembles a pastry board.

Method: Pour a little boiling water into the already warmed basin, and sprinkle in the meal with the left hand, continuing to add it, and more water, till the mixture has reached a firm consistency, and sufficient of the meal has been stirred in for the size of the poultice required. The stirring is done quickly with the knife held in the right hand; when ready, turn the mixture out on the linen and spread quickly and evenly with the knife, which should be dipped at intervals in a jug of hot water; this is in order to prevent it sticking to the meal. Turn down the spare edges over the poultice, and apply, covering with a thick piece of wool or flannel kept in place by a bandage or binder. A well mixed poultice should leave the sides of the utensil in which it is prepared quite clean when turned out, and should not adhere to the skin when taken off. For sensitive skins when poultices have been long continued, a piece of fine muslin may be used to cover the poultice with, or the skin

smear'd with a little oil or vaseline. Isolated tender spots may be covered with a thin piece of wool dipped in the oil or vaseline. On removal of the poultice a pad of cotton-wool is applied to the part to prevent the risk of the patient catching cold. Linseed meal poultices, if large, are generally applied three hourly, if small, two-hourly. In either case everything for the next application should be got in readiness before the first poultice is taken off. Poultices should be made as quickly as possible, as they should be applied as hot as can be borne. If a poultice has got cold or lukewarm in the process of making it should be rolled up with the meal side inside, and put in the oven between two hot plates till warm again.

(6) *Bran Poultice*. This is made in the same way as the linseed poultice.

(7) *Bread Poultice*. Stale bread is broken into small pieces and a quantity sufficient to make a poultice of a firm consistency boiled in water for a few minutes. The surplus water having been strained off through a piece of muslin, the poultice is spread on lint or linen and applied in the usual manner. Bread poultices need renewal at short intervals as they soon become cold.

(8) *Mustard Poultice*. This is a mixture of mustard and linseed meal, in the proportion of 1 to 8 parts of linseed meal for an adult, and 1 to 12 or 16 parts for a child. The mustard is mixed with the dry linseed, before adding the boiling water, and made in the same way as a linseed poultice. It is always advisable to smear the skin with a little olive oil or vaseline before these poultices are applied, or cover the poultice with a piece of fine muslin. They should be kept on till a burning sensation is experienced and should not be repeated except when ordered.

(9) *Jacket Poultice*. These are usually of linseed meal and are applied to both back and front of chest, extending well over on each side of the chest. They are made on two large pieces of linen kept in place by a strap of cloth pinned on to each piece over the shoulders. Keep in place with a binder of flannel, or a folded towel pinned round the body.

(10) *Starch Poultices*. For irritable affections of skin, such as scabs on the head, mix a tablespoonful of starch in cold water and add boiling water till it is a smooth paste, spread on linen and apply.

Such poultices as those already described, except No. 2, are quite unsuitable for application to an open wound or where

there is abrasion of skin, because they are not aseptic. Where there is an open wound requiring fomentation, the directions given in Prescription No. 6 should be followed, or the directions given under (2) fomentations for open wounds.

Antiphlogistin, a preparation of a number of medicinal ingredients, has largely superceded the poultice.

It is easier to prepare and does not require such constant changing.

It is prepared by placing the tin into a saucepan of boiling water which is kept boiling until the antiphlogistin is hot. It is then spread with a warm spatula on to the smooth side of a piece of lint, the edges of the lint turned over and applied in the same way as a poultice, covering with a layer of cotton wool and held in place with either a binder or bandage.

Baths. Judiciously used, warm baths are remedies of great utility, but improperly used they do harm. The effect of a hot bath is to relax the muscles, to dilate the peripheral blood-vessels, and ultimately to produce faintness. In weakness of the heart this danger is exaggerated. It is, therefore, necessary to watch a person placed in a warm bath; while in the bath the reclining position should be assumed, as this renders fainting less likely. The time which a person should remain in a warm bath must be regulated by the effect. Faintness requires removal; the person should lie down, and be dried in that position.

The temperature for baths is:—Cold bath 60° to 70° F, tepid bath 70° to 85° F, warm bath 85° to 95° F, hot bath 100° to 106° F or higher.

The skin of infants will suffer from a degree of heat innocuous to an adult. Infants have been scalded to death in too hot baths.

The complaints for which warm baths are most useful in adults are those accompanied by great and spasmodic pain, as gravel, rupture, or stoppage of urine. For children warm baths are chiefly required in convulsions, croup, pain in the bowels, restlessness from teething, flatulence.

Modified Turkish baths are often beneficial to tropical invalids, who, without organic disease, suffer from prolonged residence in the East. The patient should leave the hot chamber as soon as perspiration occurs, and should take a tepid douche, instead of the plunge into the cold bath. The mistake usually made is staying too long in the hot room. Small portable steam baths can be purchased for use at home.

The Cold Bath. In India, the cold bath as a means of reducing temperature is sometimes a matter of difficulty, since a full-sized bath in which the whole body can be immersed at one time is not usually met with. When obtainable the mode of procedure is as follows :

The patient's clothes having been removed, a towel is pinned across his loins, and a sheet slipped under him on which he is lowered into the bath, in which a pillow or air-cushion should have been placed. This makes him more comfortable, as does also a strip of canvas or cloth tied round the bath on which his head can rest while he is undergoing the treatment. A blanket is thrown over the bath and an ice-bag or piece of cloth wrung out of iced water should be kept on the patient's head. The temperature of the water is gradually reduced from 90° to 65° F, by means of ice, and the length of time usually allowed for the bath is from ten to twenty minutes. Excessive blueness of the skin or a feeble pulse would be indications for an earlier removal. The patient is lifted out on the sheet, which should be allowed to drop away, while the blanket over the bath falls on him and covers him on his passage to the bed. This should have been got ready with a warm blanket spread over it on which he is received. The patient is then dried with warm towels, and his nightgown put on, and a warm drink given him. In cases of collapse a hot bottle will be required for his feet, and a stimulant such as brandy in hot water given to him. The temperature after the cold bath should be taken in the mouth or rectum.

Hot Baths. Hot baths may be for general or local application and may be of plain water or medicated.

General Hot Bath. Proceed as for a cold bath, the water being at a temperature of 100° F. The patient is lifted into the bath in a sheet, and covered over with a mackintosh and blanket. The former is drawn away quickly when he is taken out, and the blanket tucked closely round him while he is being carried back to bed, where he is left between warm blankets. Cold drinks may be given.

Hot packs, hot baths, are, like vapour and hot-air baths often ordered for kidney disease. Great care should be exercised to prevent the patient getting a chill.

Medicated Hot Baths. Mustard Bath. A tablespoonful of mustard to every gallon of hot water is generally ordered for an adult and $\frac{1}{2}$ this strength for a child. In all cases the mustard should be tied in a muslin bag, from which it can be

squeezed when put into the water. This kind of bath is very often ordered for children, when its temperature should range gradually from 95° to 100° F. The child is kept in it, if necessary in the nurse's arms, till the skin is slightly reddened, when it is removed and put between warm blankets. Care should be taken that the child's whole body, except the head, is kept immersed in the bath. A mustard bath as a foot bath is very soothing for a bad cold.

Bran Bath. 2 or 3 lbs. of bran are enclosed in a gauze bag and thoroughly soaked and squeezed into the bath water.

Brine Bath. From 4 to 8 pounds of common salt is mixed with hot water in an ordinary sized bath.

Alkaline Bath. This is frequently ordered in cases of chronic rheumatism and is prepared by adding 1 pound of sodium bicarbonate or washing soda to a large bath of water.

Iodine Bath. One ounce of tincture of iodine to a gallon of hot water is the usual proportion.

Hip Bath or Sitz Bath is ordered generally for pelvic diseases or difficulty in micturition.

A zinc bath is used, the water being only sufficient to cover the patient's loins, while his legs hang over the edge of the bath. Cover him closely with a blanket while in the bath, so that the upper portion of him not in the water may not get chilled.

Bladder Wash-out. The same apparatus as for a rectal wash-out is used, the catheter being either of glass, metal, or rubber. If of glass or metal it should have a piece of rubber tubing attached to it to connect it with the piece of glass tubing mentioned for giving nutrient enemata. This latter glass tube may be dispensed with if care is taken completely to fill the apparatus with the lotion ordered, so as to exclude the air.

Warm boric lotion (Prescription No. 14) is usually used for a bladder wash-out, and careful asepsis is necessary. The whole apparatus having been boiled before use and the orifice of the urethra washed with aseptic hands with some antiseptic solution, such as Prescription No. 14 or No. 19, before the catheter is inserted, the funnel is then raised and depressed as described in 'rectal wash-out' (see p. 591) till the fluid is finished. Gentle pressure over the bladder, just as the catheter is being withdrawn, will assist in the complete return of the lotion.

Blisters. These are produced by means of cantharides plaster or blistering fluid. Before application the part should

be washed with soap and water, and then sponged with methylated spirits in order to remove the grease from the skin. Cantharides plaster is spread thinly on a piece of sticking plaster, leaving a margin which, when the blister is applied to the skin, adheres and maintains the whole in position. The plaster cut to the required size is slightly warmed and placed on the spot to be blistered, and kept in position with a loose bandage, so that there may be no pressure on the blebs. In young children it is advisable to put a piece of fine muslin between the plaster and the skin. The blister begins to smart in about two hours, and may be taken off in six or eight hours. But the time necessary to produce a blister depends on the sensibility of the patient's skin. If no blebs form or only a few, a fomentation or poultice may be applied. When the blister is taken off, all the raised blebs should be snipped at their most bulging parts with a pair of sterile sharp scissors, and the fluid allowed to drain out, then remove the raised skin. The part should be dressed with Prescription No. 82 spread on lint or linen, the dressing requiring to be changed thrice daily.

If, after blisters, boils form near the part, they should be fomented or poulticed.

Blistering Fluid. Where this is used the part operated upon should be outlined with some kind of emollient, such as vaseline, to prevent the fluid extending to the surrounding parts of the skin. Two or three coats of the fluid may be painted on, time being allowed for each to dry before the next is applied.

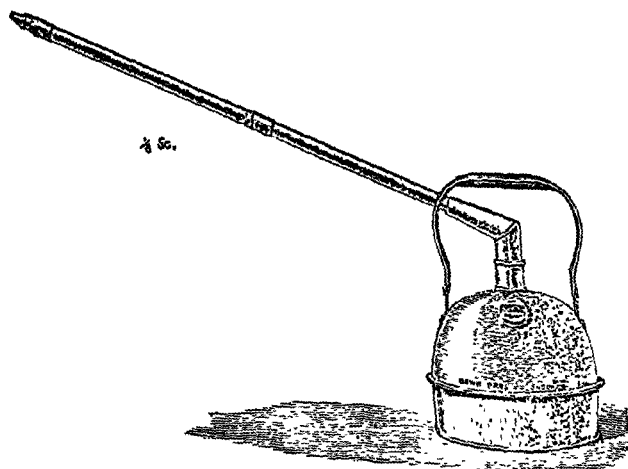


FIG. 49 Bronchitis Kettle.

a feather or camel's-hair brush being useful for the purpose. A pad of wool secured with a loose bandage is then put on, the after-treatment being the same as for a cantharides plaster. No kind of blister should be applied to children except under medical advice.

Blood-letting. Formerly blood-letting from a vein of the arm was freely practised for fevers and as a part of various reducing treatments. It is but little employed now, but may even save life in acute congestion from heart or lung diseases. It should only be performed by a doctor.

Bronchitis or Steam Kettle. This is a large-sized kettle with a tube about 2 feet long in place of a spout. An ordinary kettle can be used with a tin tube made to fit over the spout. It is filled with boiling water, and kept at a suitable height on an spirit lamp beside the bed, care being taken that there is always a steady flow of steam issuing from the tube.

The head of the bed should be closed in by sheets or blankets, they being hung round the back and sides of the bed to about half its length, the top also being covered, thus forming a tent to prevent the escape of the steam into the surround-

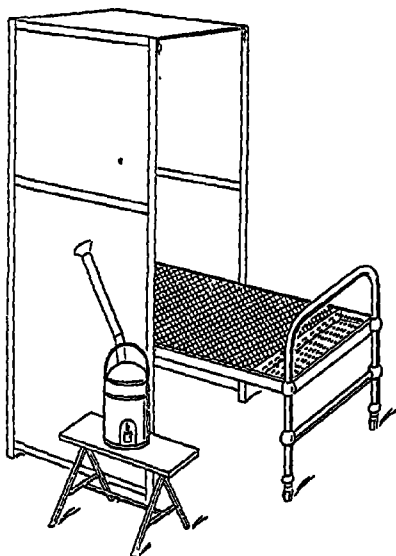


Fig. 50. Diagram to show arrangement of a half tent round the Head of a bed for use with a bronchitis kettle.

ing atmosphere. A proper tent frame for use with a bronchitis kettle is not always obtainable, but a couple of clothes-horses, or screens, arranged at the head of the bed, answer the purpose. In their absence the mosquito curtain frame can easily be utilised for hanging the coverings on.

The end of the kettle-tube is inserted just within the tent at the side of the bed, care being taken that it is nowhere within easy reach of the patient if he happens to be delirious, or if he is a child. There have been many instances of accidents in these cases through the patient seizing hold of the end of the spout and scalding himself. To avoid such calamities it is safer to put a child into braces made of cloth (*see* Fig. 51)

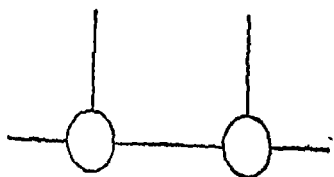


Fig. 51 Diagram of child's braces

the arms going through the loops, to which are attached straps to be tied on to the head and sides of the bed. A wire cage about 6 inches square, one side of which is open, can easily be made for the protection of the end of the tube. It is tied on to the rails at the side of the cot with the open side against the rails, and the end of the tube inserted in it. The latter in a proper bronchitis kettle, is usually supplied with a flattened out detachable funnel having a bit of wire gauze within it, in which is a bit of cotton-wool whereon may be sprinkled some tinct. benzoin, &c., if such inhalation be ordered.

When a bronchitis kettle is used, care must be taken that it is kept going constantly till discontinued, in order to maintain an equable moist atmosphere with the avoidance of draughts.

The Passing of a Catheter on Female Patients. The catheter may be of glass, metal, or rubber, and should be boiled for 10 minutes before being used. The patient lies on her back, with her legs drawn up, and knees separated, a sheet being thrown over them to prevent undue exposure. A basin to catch the urine is placed between her knees on the bed. The nurse with carefully washed hands separates the labia and washes the parts round the meatus with an antiseptic lotion

such as biniodide of mercury 1 in 3000, one part of Prescription No. 13 to two parts of water ; then keeping the labia separated with the thumb and forefinger of her left hand she introduces the end of the catheter into the meatus with her right hand, and allows the urine to flow into the receptacle on the bed. Gentle pressure over the bladder towards the end will assist in the complete evacuation of the urine. Should the end of the catheter touch anything, such as the bedclothes or the surrounding skin, it should be reboiled before being used. If the catheter is of rubber, some sterilised oil will be required for lubricating it. Sometimes the urine ceases to flow before the bladder is empty, in which case the catheter should be slightly withdrawn and then replaced.

When glass or metal catheters are used, a short length of rubber tubing should be attached to the end to guide the flow of urine into the basin. This prevents the urine from dribbling down the side of the catheter. When removing the catheter, pinch the tubing with the right hand, or stop up its orifice with the forefinger, to prevent the urine left in it at the moment of removal from soiling the bedclothes.

A catheter should be cleansed after use by being held under a tap with the eye upwards and allowing a strong stream of water to flow through it.

Climates. Tropical climates have a deteriorating effect both on the European races and the indigenous populations. In popular language the inhabitants become 'slack'. That is why leave home is so beneficial to the Englishman in India and reflects its advantages in his more energetic work. The climate differs much in different parts of India ; but, apart from the hills, the climates are principally either dry and subject to extreme heat in the summer and moderate cold in the winter, such as the climate of the Punjab, or they are moist, warm, and equable as those of Bengal and the Bombay coast. Intermediate between such extremes is a climate like that of the United Provinces, which resembles that of the Punjab more than that of Bengal in its greater part.

There are many factors that determine the climate of a place, such as the local soil, the amount of vegetation and water, the configuration of the land, rainfall, prevailing winds, elevation, and distance from the sea. But the principal factor is the temperature, and the distance from the equator is a factor in determining that.

Fortunately people get acclimatised to their own part of

India, and consequently dislike parts where the climate is radically different, and sometimes never feel well there. Hence the resident of the Punjab feels miserable in the damp heat of Calcutta, and pities the pallid inhabitants of Bombay; while the down-country man wonders how any one can prefer the dry and extreme breathless heat and dust of the Punjab. In a dry heat man maintains his constant body temperature principally by radiation, hence the tall thin man, who has a larger surface of body area, feels more comfortable in the Punjab: while the short fat man, who relatively loses more heat by sweating, is better designed for life in lower Bengal than his tall comrade.

Of the hill climates of India the Himalayan are the best, the stations there varying from 3,000 to 10,000 feet in height. These climates are very beneficial to Europeans after most illnesses or after residence in the plains, but they must not be considered equal to a change to England. For one thing the direct rays of the sun are in the hills still powerful and in the summer the climate is not so invigorating as in England: for another, the food to be obtained there is by no means equal to good English fare. Where it becomes a question of going to the hills or going home, the patient must be guided by his doctor's advice, which will have reference to the nature of the illness, the probable length of convalescence, and the personal requirements and conveniences of the patient.

Convalescents from acute illness do well in the hills; so do all children, and cases of anæmia and of chronic malaria, provided that care be taken, on making the change, that the patient does not catch a chill.

Cases of chronic dysentery or of diarrhoea as a rule are not suited for the hills, and in this respect some hill stations are worse than others; usually the high but damp stations, as Darjeeling, are ill-suited for diarrhoeas.

Cases of heart disease are not suited for the higher hill stations: on the other hand they do not stand great heat well, so it is better to send them to a moderate elevation of from 2,000 to 4,000 feet.

Regarding cases of phthisis or pulmonary tuberculosis they all do badly on the plains in the hot weather. The factors that are so harmful to these patients are heat, dust, and strong winds. For nearly all early cases of phthisis the hills are especially suitable, and in some of the best sites sanatoria for this disease have been established. But cases of phthisis with

high fever, and those with affection of the larynx, should not be sent to the hills: if the evening temperature be as a rule over $100\cdot4^{\circ}$ F, the patient is not likely to benefit from a high elevation. Even amongst early cases of phthisis there are some, of bronchitic nature, who do best in a moist and equable climate, such as may be obtained on the sea coast.

Cases of chronic bronchitis, not tuberculosis, and those with emphysema are likely to do best in a warm, moist, equable climate on the plains: they should avoid the hills. In a warm, moist climate also, cases of Bright's disease should reside: kidney diseases should avoid the hills: a climate that will allow free action to the sweat glands is likely to give them most relief. Regarding asthma, although this disease is often more profoundly affected by change of climate than any other, it is impossible to lay down any rule as to which climate is better, it is so largely a matter of individual idiosyncrasy, and this idiosyncrasy may act over quite a small area.

Dry Cupping. Place a small strip of blotting-paper, soaked in methylated spirit, in a warm cupping glass, or ordinary wine-glass, having previously moistened the edge of the glass with water or oil. Light the paper, quickly invert the glass over the place chosen having been previously well washed and press it firmly against the skin. The closure of the glass extinguishes the flame, and a partial vacuum being formed, the skin rises inside the glass.

Wet cupping is done similarly, but before applying the glass small incisions are made in the skin with a scalpel, or with a special scarificator.

RECTAL INJECTIONS OR ENEMATA.

These may be of five kinds, in accordance with the purpose to be served: (1) Purgative; (2) Constipating; (3) Nutrient; (4) Saline; (5) Medicated.

(1) **Enemata Purgative.** These are given for the purpose of producing an evacuation of the bowels, and may be of various kinds.

Apparatus required—one of the following:

1. Higginson's enema syringe, as being light, portable, and suitable for travelling.

2. A douche can of enamelled iron or glass, or a glass funnel, or the barrel of a 2-ounce glass syringe to which about a yard of rubber tubing is attached with the nozzle belonging to the Higginson's syringe.

For both the above apparatus a No. 12 or No. 14 rubber catheter attached to the nozzle will be found useful when a high enema is ordered, as in cases of long-continued constipation.

3. *For young children*.—An india-rubber ball with nozzle capable of containing about 4 ounces; or the glass barrel of a 2-ounce syringe with No. 8 rubber catheter attached to it. The rubber ball mentioned is very difficult to keep clean.

4. Glycerine enema syringe.

For a soap and water enema take from 1 to 2 ounces of a pure unscented soap and melt by means of adding boiling water. When the soap is melted add the remainder of 2 pints of boiled water making the whole solution a temperature of about 103° F.

Place the patient on his left side if this is possible and having oiled the nozzle or catheter insert it into the anus, taking care that there is no air in the tube or syringe. This is done by allowing the fluid to fill the syringe before use. Press the buttocks together with the left hand while giving an enema, continuing to do so for a short time after the removal of the nozzle. The enema should be given gently and slowly, all forcible pumping when using a Higginson's syringe being undesirable. In all cases see that the bed is protected by a mackintosh and that the bedpan is in readiness to be used if necessary directly afterwards, though a patient should be encouraged to retain the enema as long as possible. In cases of incontinence of fæces it is often possible with a little practice to give the patient the enema on the bedpan, the edge of the pan being inserted under him at an angle as he lies on his side.

For children, the buttocks should be raised on a pillow placed under the mackintosh. This helps them to retain the enema.

Enema of Soap and Water and Olive Oil. When this is ordered, 4 to 6 ounces of the oil is added to the pint of soap and water. In order that it should mix well, it should be added gradually after the soap has been dissolved in a small quantity of the hot water, the rest of which is added afterwards.

Turpentine about $\frac{1}{2}$ ounce, being useful for the relief of flatus, is often ordered with a soap and water enema with the addition of the same amount of olive oil. The turpentine and olive oil should be added before the larger quantity of hot water and thoroughly mixed in. If poured in at the end there is a chance of its floating in globules on the surface of the water.

A warm Olive Oil Enema of about 4 to 6 ounces or even more

is often given for persistent constipation, followed after a few hours or even the next day by a simple soap and water one.

Castor Oil Enemata. 2 to 4 ounces of castor oil are mixed with 4 to 8 ounces of olive oil, the whole being well warmed before being injected. When castor oil or olive oil are ordered to be given without the admixture of soap and water, the apparatus used should be for preference a funnel or the barrel of a glass syringe already mentioned with tubing and nozzle attached, as the oil is apt to make a Higginson's syringe greasy and to clog it.

Glycerine Enema. This is usually given by means of a specially constructed enema syringe with a vulcanite nozzle and glass barrel, but an ordinary 2 ounce glass syringe can quite well be used. The usual amount ordered for an adult is one ounce. The glycerine should be warmed before injection, and should not be mixed with water unless it is found to be too irritating by the patient.

For very young children a small piece of pure plain soap inserted into the anus with the finger often results in an evacuation of the bowels.

(2) *Constipating Enema. Starch and Opium Enema.* This is ordered to check excessive diarrhoea. For an adult 2 ounces of starch mucilage is mixed with 20 or 30 minims of tincture of opium. It should be given nearly cold and very slowly by means of the apparatus already described, consisting of a funnel or glass barrel and catheter attached. It should not be thought that such an enema as this, which is meant to be retained in the bowel and not expelled like the purgative enemata, is really curing the diarrhoea, although it may make it less. The starch and opium only allay the irritation of the rectum for the time and allow the patient to retain the motions longer, so that it is a useful enema at bedtime in order to give a patient with diarrhoea a restful night. It does not aim at treating the condition which is the real cause of the diarrhoea.

(3) *Nutrient Enemata.* Nutrient enemata containing pre-digested food such as milk, beef, tea, eggs, etc., are now very rarely used as it is thought that glucose in solution is the only type of food absorbed by the large bowel. This is prepared by adding an ounce of glucose to a pint of normal saline and given very slowly with a catheter and funnel in the same manner as a saline.

(4) *Saline Rectal Injections.* These are made of solution of common salt in water, 1 drachm of salt to the pint of

water. They are used in cholera and other conditions of collapse and to allay thirst when water cannot be given by the mouth. They are usually given at a temperature about 104° F. These injections should be given slowly with a funnel and rubber tube as already described. They are intended to be retained in the bowel, and the hips of the patient should be raised well and the pillow removed from the head so that the injection may reach as high up the bowel as possible.

Two pints may be given to an adult, though usually more than one pint will not be borne at first, and half a pint to an infant.

Coffee. About 6 to 8 ounces of strong black coffee with a little salt added is often ordered as a stimulant in cases of collapse or in opium poisoning. This is given in the same manner as the saline injections.

Saline may also be given subcutaneously, but when this is ordered all instructions are given by the doctor.

(5) Medicated Rectal Injections. In a similar way to the saline rectal injections just described injections containing drugs such as potassium permanganate or others may be given. Such an injection is useful in some cases of chronic dysentery or to cleanse the bowel of children with foul diarrhoea. Enough potassium permanganate should be used to make the water a strong pink, and the injection should be retained by the patient for ten or fifteen minutes if possible. The method of giving the injection and the quantities are the same as for the rectal salines. The water should be conveniently warm.

The Flatus Tube. This is a long thick rubber tube with a hole at one end, and is used for the expulsion of gas from the bowel in cases of abdominal distension. Having warmed the tube in a basin of warm water, the end with the smaller hole is oiled and inserted to about 8 inches of its length up the rectum, the other end meanwhile being kept all the time in the bowl of water, otherwise air would be introduced. The escape of gas causes bubbles to appear in the water.

The tube should be left in about half an hour at a time.

Hyperæmic Treatment. Hyperæmic treatment consists in assisting nature to bring more blood to an inflamed part: i.e., in producing congestion. This can be done by a firm bandage for the arm or leg, or by some form of suction apparatus. Little suction cups are now sold for application over boils and are of assistance in hastening their course and in securing a free discharge of the matter.

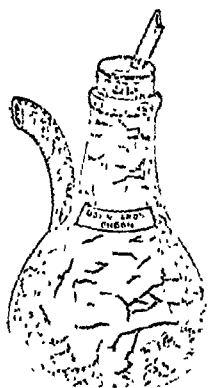


FIG 52 Inhaler.

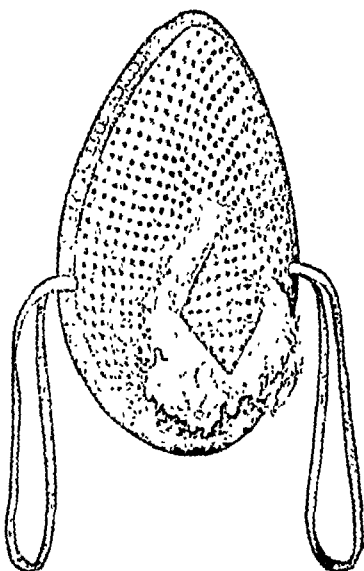


FIG. 53. Burney Yeo's Inhaler for Dry Inhalation.

Inhalations. Apart from the bronchitis kettle described above, drugs may be given by means of an 'inhaler.' Of these there are two principal kinds, the moist and the dry, a specimen of each of which is pictured here. In the former the medicament to be used is placed in boiling water: in the dry, or Burney Yeo's inhaler, it is poured, a few drops at a time, on cotton-wool at the apex of the inhaler.

The moist inhaler is principally used in bronchitis and in throat diseases: while the method of dry inhalation is employed more often in the treatment of pulmonary tuberculosis.

How to give a Hypodermic Injection. It will not often be necessary for the reader of this book to give a hypodermic injection. When a doctor is available this proceeding should certainly not be attempted without him; but where it is impossible to obtain medical aid hypodermic injections may be given when urgently required, such as of morphia for the relief of severe pain, or of emetine for amœbic dysentery.

For the purpose a hypodermic syringe is necessary, and an all-glass syringe is the best of its kind. Such are made cheaply nowadays and should take to pieces entirely. The syringe must be carefully sterilised by boiling it in water together with

a pair of forceps, the water remaining at the boil for at least five minutes. Then the forceps may be fished out of the water and by its means the syringe put together. If the syringe is required for use at once it may be cooled by putting it in some cold 1 in 20 carbolic lotion before being put together.

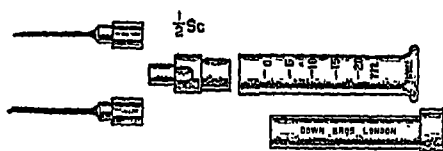


FIG. 54. All-glass Hypodermic Syringe.

The needle is affixed also by the forceps and the syringe is ready.

The substance to be injected, if a liquid, is then sucked up into the syringe: if in solid form, and it usually is in the form of a small tablet, it must be first dissolved in some water that has been boiled in a small spoon. The tablet can be put in the water while it is still almost boiling and when it has dissolved the liquid can be sucked up into the syringe. The syringe should then be turned needle up, and the piston moved until the bubbles of air in the barrel have been expelled. If there is any doubt as to the sterility of the needle, this may be secured now by slowly passing it through the flame of a spirit lamp. It is usual to give a hypodermic injection in the forearm, and the spot selected should be painted over with tincture of iodine just before the operation. A fold of skin, skin only, not underlying tissues as well, is now picked up between thumb and finger of the left hand, and, with the syringe held in the right hand, the needle pushed boldly in. When in properly the needle will be felt to be free in a subcutaneous space. The piston should then be pushed home down the barrel, or as far down the barrel as the dose is intended to be given and the needle then withdrawn, the left thumb and forefinger still steadying the patient's forearm during the withdrawal.

Iodine Paint. This is sometimes used instead of mustard or blisters. It should be lightly applied with a feather or brush every day, or less frequently after the first three or four days, so as to maintain an irritation of, but not to blister, the skin.

Iodine paint acts more energetically on some sensitive skins, and therefore must be used with caution. The ordinary effects are, after a second application itching and smarting, which soon subside. After several applications, the upper layer of skin becomes loose and may be rubbed off. If too much paint is applied or the part covered before it is quite dry, blisters may form. For sensitive skins, the mild tincture of iodine, which is less than one-fourth the strength of the official strong tincture of iodine, should be employed. But, generally, the iodine paint of Prescription No. 9 will be found the most useful. When used for daily and long-continued application over extensive areas, it is advisable to paint it on in strips of about 1½ inches wide, leaving an interval of the same width of skin free, each strip being painted on alternate days.

As iodine in any form of paint stains the clothes, the part painted should be covered by a piece of lint or linen. Iodine stains may be removed from clothes by washing them in a solution of carbolic lotion 1 in 20, Prescription No. 16.

There is now a patent preparation called Iodex. This can be rubbed into the skins of most patients without any ill effects, and also has the advantage of not staining the clothes.

Leeches—How to Apply Them. The leech has three teeth, and makes a triangular wound. The Indian leech, being smaller than the European, does not take so much blood. Leeches should be kept in a cool place, in a jar of water with mud at the bottom, the mouth of the vessel being covered with muslin. The water should be changed every two or three days. There is often trouble in getting leeches to fix. The part to which they are to be applied should be cleansed with a cool moist cloth, so as to leave it damp. If they do not bite readily the part may be moistened with a little sugar and water, or, milk. If this does not answer, the skin may be slightly scratched with a sharp needle till the blood comes. Sometimes rubbing a refractory leech in a dry towel, or placing it for a moment in warm water, will cause it to bite. To apply leeches in one circumscribed spot, put them all in a wineglass, which is to be turned down over the part. If required over a large surface, they must be put on singly; they should be held lightly by the tail, wrapped in a piece of wet cloth, so that they may not be inconvenienced by the heat of the hand. If the leech does not fix soon, it is better to return it to the water for a time, trying another in the meantime. More leeches than the number to be applied should be obtained, as, often, some will

not bite. It is advisable, if possible, particularly with children, to apply leeches over some bone, against which pressure may be exerted to stop the bleeding, if necessary. A rule with regard to children is to employ small leeches. Two little leeches may be used instead of one large one, the bites of the former rarely bleeding so much after their removal. When applied, they should not be disturbed or torn off, as the teeth may be left in the wound. They should be covered with a light cloth until, having filled, they will fall off, in about three-quarters of an hour. Then the leech-bites should be fomented with hot water, if it is wished to encourage the flow of blood, otherwise they should be covered with dry lint. A little salt should be sprinkled on the leeches after they drop off, which causes them to disgorge the blood, if required again. They should then be returned to clear water, which should be frequently changed. A leech will suck nearly 1 drachm.

Leech-bites will generally stop bleeding without interference; if not, the measures noted at p. 275 should be adopted.

Massage. Massage is methodical shampooing, and consists of rubbing, stroking, kneading, principally in the direction of the muscles. It stimulates the skin, muscles, and superficial vessels, promoting the flow of blood and lymph and the excretion of effete matter, thus exciting appetite to supply the place of removed material. It also increases the muscular strength and promotes sleep. In these ways it proves a substitute for exercise. In some cases massage may be efficiently performed by Indian servants, who freely practise this remedy themselves. But in most cases skilled knowledge is required such as is only obtained from a skilled nurse or masseur.

Massage is contra-indicated in diseases of the heart, phthisis, gastric ulcer, and acute inflammations of joints: but is useful in some chronic inflammations of joints, and, with or without rest, treatment is most useful in many nervous diseases, especially in hysteria and neurasthenia.

Mustard Plaster. This is used as a means of counter-irritation. Mustard and flour in the proportion of two of the former to one of the latter are mixed into a smooth paste with cold water, and spread on a piece of brown paper or on some non-porous materials of the size required, and applied to the spot, being kept in position, if necessary, with a piece of cotton, wool and a bandage. When the maximum effect of a mustard plaster is desired do not mix it with boiling or even hot water, as this changes the character of the mustard. For very tender

skins, and always for children, the plaster may be covered with a piece of fine muslin, the proportion of flour being increased. For children it should never be applied without orders. It is left on till a burning sensation is experienced and a uniform redness without blisters produced. On removal, generally after twenty minutes for an adult, sponge the part with some warm olive oil, and dust with powder, covering it afterwards with wool and a bandage to exclude the air. Mustard leaves, sold by chemists usually in packets of six or twelve, are a useful and handy substitute for a mustard plaster, but these should have been kept in sealed tins, and should be fresh, as otherwise they often prove to be ineffective. They are applied wet, after being dipped in cold water for a moment before application.

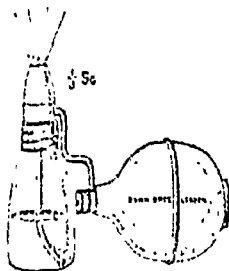


FIG. 55. Nebuliser.

Nasal Douche. A nebuliser of the pattern illustrated or one similar may be employed with advantage in the treatment of a cold in the head, which see. The glycolhymoline solution there recommended or a similar one may be used.

Nasal Feeding. The apparatus required is similar to that for giving a nutrient enema, and consists of the barrel of a 2-ounce glass syringe, or a glass funnel capable of holding about 2 to 4 ounces, to which is attached a foot and a half of rubber drainage tubing; the latter being connected by a small glass tube a couple of inches long with a rubber catheter. This may be a No. 6, 8, or 10, according to whether it is required for a child or for an adult. The whole apparatus should be brought to the bedside in a bowl of warm water, and the feed to be given should likewise be in readiness at a temperature of 100° F and having been strained. The last is necessary in order to avoid possible blocking of the eye of the catheter. The easiest position for nasal feeding is the recumbent one. The patient lies on his

back, a low pillow, if any, under his head, which should be inclined to the left side and slightly extended backwards, the chin pointing upwards. This position helps to prevent the catheter curling up in the pharynx. The mouth should always be kept closed, and the catheter inserted as quickly as possible. With children, it is advisable to roll the child round in a sheet or blanket to prevent struggling. Having got everything in readiness, and seen that the nostrils are clear, stand on the right side of the bed, and place the bowl beside the patient on the left; then after emptying the apparatus of water, leave the funnel turned downwards in the water (this in order to exclude air while the catheter is being inserted), and having the entire length of the catheter smeared with sterilized olive oil, seize it between the thumb and forefinger of the right hand at about 4 inches from the eye, and quickly insert the point into the nostril in a backward and downward direction; if directed upwards it will strike the roof of the nose and curl up. The catheter should be allowed to descend until the glass tube is within 2 inches of the nose. The glass tube is only for the purpose of seeing that there are no air bubbles present when giving the feed. Allow a moment or so to elapse to see that the catheter is in the right position and not in the windpipe. Such a misplacement in a conscious patient would result in a fit of coughing, also it would be noticed that air proceeded from the funnel at each expiration only. Bubbles of gas from the stomach will probably make their appearance in the water under the funnel. As soon as the patient has got accustomed to the presence of the catheter lift the funnel out of the water with the left hand, nipping the rubber tubing just below it with the second and third fingers of the same hand. Then pour in the feed quickly and evenly, till it is finished. If there is any stoppage in the flow, do not pull out the catheter, but run the fingers a few times down the length of tubing attached to the funnel. The catheter should be withdrawn before the last of the food has left the glass tube, otherwise air would be introduced. To withdraw, hold the catheter firmly just before the nostril, and do not let go till it is entirely withdrawn, else there is every possibility of the small quantity of food still remaining in it descending the windpipe, and thus producing a fit of coughing, and probable vomiting. Nasal feeds are usually given four or six hourly, according to the age of the patient and quantity ordered. The nostrils should be used alternately, as a long-continued course of nasal feeding is apt

to produce irritation and soreness in them. After use the apparatus should be taken to pieces and well washed, the catheter being held eye upwards under a tap if possible. It is then left in boric lotion till the next occasion.

Rest Cure. A rest cure, or, as it is sometimes termed when employed in its full and unmodified form, the Weir Mitchell treatment, consists in the absolute rest in bed of the patient, his isolation from relatives and friends except for the one nurse who is to look after him, and a generous diet containing plenty of milk, with the addition often of massage and sometimes of electrical treatment. The rest must be entire, no reading allowed at first, though the patient may be read to an hour a day by the nurse; letters are not to be received or sent, and women are not even allowed to do their own hair, nor to sit up in bed at first. The treatment commonly lasts a month or six weeks. To carry it out in full a nursing home is expedient; but a modified form of rest cure may often be adopted with advantage where a firm-minded but kind relative may take the place of the nurse, and the cure carried out in quiet lodgings in the country or even in a friend's house or hotel in the hills. The kind relative, however, cannot be the patient's husband. Such treatment is most beneficial for severe neurasthenia, or hysteria, and for some other conditions, especially those involving nervous fatigue, conditions which are not uncommon in India. It is usually women who require rest cures. Often the mere separation from their husbands for a month or so is sufficient to restore their health: and for this reason the domestic separation sometimes involved by the onset of the hot weather in India, hard though it often seems, is not always an entire misfortune.

A rest cure may be a failure if not strictly conducted. The companion or nurse should be always patient, but not too sympathetic when the invalid exaggerates her woes, as sometimes she does, and be always firm when she is fractious. Sometimes the chief difficulty is over the milk which has to be got down, but this must be insisted on. It is well to begin treatment on milk only, a glass of milk every two hours, and then to add cream and eggs, and get on to a meat diet, still insisting on at least three pints of milk daily. After the month in bed, an after-treatment in a bracing climate is often beneficial.

Sprays. For the application of medicaments to the back of the pharynx or to the larynx, or for any form of sore throat,

a spray is often useful. The action is simple. Such a spray with two ends, one for the pharynx and one for the larynx, is here illustrated.

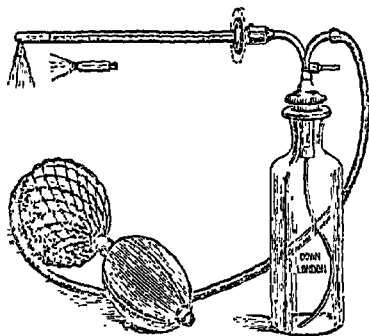


FIG. 56—Spray for Pharynx or Larynx.

If the medicine to be used is oily, the spray should be of the kind called an atomiser or nebuliser; a nasal atomiser is illustrated here. By the aid of compressed air the medicament is forced in a spray against the side of the containing glass, and so escapes as a fine vapour. The proprietary medicine glycothymoline may with advantage be employed in this way in nasal and throat catarrhs.

Cold Turpentine Stupe. Take a piece of flannel and wring it thoroughly out of turpentine; apply cold as a fomentation; turn up the edge of the flannel frequently and remove when the skin is well reddened. Three minutes, or even less, may be enough for a young child.

Transfusion. Transfusion is the term originally used to describe the direct transference of blood from a healthy person to a sick or anæmic patient. It has its dangers and is only employed under special and serious circumstances.

Vaccines and Tuberculin. A vaccine is an emulsion of dead micro-organisms; rarely living vaccines may be used. They are used in the treatment of diseases due to these organisms and act by producing immunity to living organisms of the same kind as the dead ones injected.

It requires high pathological skill to make vaccines, and they should not be used except under most efficient medical surveillance.

Stock vaccines made not from the patient's own organism but from some of the same kind, can be purchased ready diluted for injection; but skill and experience is required for

their dosage, and they are only for use by a doctor. The same remarks apply to the use of tuberculin, some varieties of which are vaccines in their nature.

Vaginal Douches. These may be given either by a Higginson's enema syringe with special vaginal nozzle, which is always supplied with it; or by means of a douche-can of enameled iron or tin or glass, to which is attached about 1 yard of rubber tubing and a glass vaginal nozzle. If with the first a basin with the lotion ordered will be required, care being taken that the end of the syringe is always well under the lotion in order to prevent the pumping in of air. If a douche-can is used, it may be hung on the wall, or held raised above the level of the bed. For purposes of self-irrigation when the patient is allowed to sit up, a Higginson's enema syringe will be found the most convenient when used over a chamber. In all cases the nozzle should have been previously sterilised. If of glass, it is easily boiled; if of vulcanite, it must be left in an antiseptic solution, such as carbolic lotion 1 in 20 (Prescription No. 16), for about twenty minutes before use.

The lotions generally employed are perchloride of mercury 1 in 4,000, Prescription No. 18 diluted; or mild tincture of iodine, 1 drachm to 1 pint. The temperature of the douche is about 104° F., and the quantity required from 3 to 4 pints. Before insertion the nozzle should have been completely filled with the lotion to exclude the air. The patient lies on her back on a bed-pan, with her head slightly lowered. The vaginal orifice is then swabbed out with the same antiseptic lotion that is to be used for the douche; and the nozzle of the apparatus introduced into the vagina in an upward and backward direction

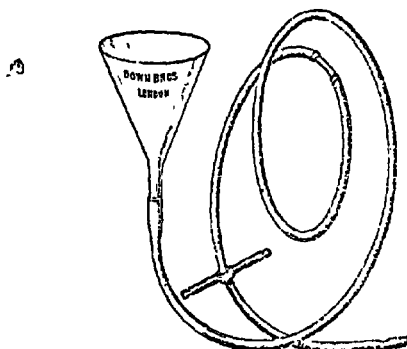


FIG. 57. Rubber Tube and Funnel.

to about 3 inches of its length, and the fluid allowed to flow until nearly finished. After removal of the nozzle, gentle pressure with the left hand over the uterus will prevent any of the lotion being retained.

Washing out the Stomach. Washing out the stomach, or lavage as it is sometimes called, may be performed by a stomach-pump, but is better done by means of a rubber tube about 4 feet long, and funnel as shown in Fig. 57. About 18 inches of the tube are to pass into the mouth, the remainder will remain outside. The end of the tube may be lubricated with a little butter, though this is not necessary, and the tube is then passed backwards against the roof of the mouth, following the curve of the palate into the gullet, and so into the stomach. At the same time the patient should be asked to swallow.

Warm water, preferably containing 1 grain of sodium bicarbonate to 1 ounce of water, should then be used to wash the stomach out with pouring it into the funnel, and, after each half-pint or pint, lowering the funnel so that the stomach contents will flow therefrom into a bowl placed on the floor. This procedure is of the greatest use in cases of poisoning, in order to remove the poison from the stomach. It is also of use in dilatation of the stomach and in other forms of dyspepsia.

A similar procedure is employed when it is desired to feed the patient by such a tube, the milk or prepared food being poured into the stomach by the funnel and left in.

Also in the feeding of children with severe sore throats, such as diphtheria, where food cannot be swallowed, it is necessary to pass a thin tube, such as a rubber catheter, down the nose into the stomach and pour in the milk in this way: see Nasal Feeding on p. 596.

CHAPTER XXI.

INVALID DIET

Albumen Water : Arrowroot or Cornflour : Barley-water : Beef-tea : Benger's Food : Bran Bread : Calves' feet Jelly : Chicken Cream : Chicken or Mutton Broth : Chocolate : Eggs : Grated Bread crumbs : Gruel : Imperial Drink : Junket : Lemonade : Liver Soup : Meat Extracts : Milk Preparations : Milk Jelly : Peptonised Beef-tea : Peptonised Milk : Raw Meat Juice : Raw Meat Sandwiches : Sago : Tapioca : Whey.

Albumen Water. The white of 1 egg to 4 ounces of cold water, or 5 whites to 1 pint of water. Lemon essence or cinnamon water as flavouring.

Carefully separate the white from the yolk, seeing that no pieces of the shell fall into the cup. Add the cold water, also a pinch of salt and stir lightly with a fork, but not sufficiently long to produce a froth; then strain. In India it is advisable to make albumen water freshly for each drink. If found too cold it can be slightly heated, but not enough to coagulate the albumen.

If the patient is on brandy this can quite well be added to the albumen water, or a little lemon juice can be used as flavouring.

Arrowroot or Cornflour. 1 dessert-spoonful of arrowroot or cornflour, $\frac{1}{2}$ pint of boiling water or milk.

Mix the arrowroot or cornflour into a smooth paste with a little cold water or milk. Pour the $\frac{1}{2}$ pint of milk over it, and boil slowly for 5 minutes, stirring constantly.

Sweeten to taste, and add wine or brandy if ordered.

Barley-water. 1 ounce pearl barley, 1 pint cold water, rind and juice of 1 lemon, sugar to taste.

Wash and blanch the barley by putting it into cold water and bringing it to the boil, after which strain and throw away the water. Another pint of cold water, sugar and lemon are then added to the barley and the whole brought to the boiling-point, and allowed to simmer for about 10 minutes. Then strain and use.

Barley-water may be made from Robinson's Patent Barley Flour. This is a quicker method.

One dessert-spoonful of the flour is mixed into a smooth paste with a little cold water and added to 1 pint of boiling

water, then brought to the boil and allowed to simmer for at least 10 minutes, stirring constantly. Sugar to taste and flavouring are added afterwards ; orange juice being sometimes preferred to lemon juice.

The above two recipes make a cooling and refreshing drink. When used for the purpose of diluting milk, usually in the proportion of 1 ounce of barley-water to 3 ounces of milk for an adult, the sugar and lemon juice should be omitted. When required for infants under three months the quantity of barley flour should be reduced to 1 teaspoonful. In the latter case, of course, sugar is added afterwards.

Barley-water should be made twice daily and be kept in a cool place. In no case, after having once been brought to the boiling point, should it be allowed to boil again, as this induces rapid fermentation, making it unfit for baby's food.

Beef-tea (slow way). $\frac{1}{2}$ pound of lean rump-steak, $\frac{1}{2}$ pint of cold water.

After removing all fat and skin shred the meat into as small pieces as possible. Place in a covered jar with the water, some salt, and a small piece of ginger, and stand the jar in a saucepan of simmering water, or in a cool oven for 2 to 3 hours. Then strain and add salt to taste.

Beef-tea (quick way). The ingredients and method are the same as above, but instead of using a jar place the ingredients in a saucepan and stir over a moderate fire for about $\frac{1}{2}$ hour, then strain and add salt to taste.

Before serving remove all fat from the surface with pieces of kitchen paper.

Beef-tea should never be allowed to boil, as boiling coagulates the albumen in the meat, thus rendering it difficult of digestion.

Gravy-beef is not good for the purpose, as it contains a good deal of gelatine, which can only be extracted by boiling. If beef-tea sets when cold, it is a sign that it has been boiled. When cooked in simmering water it is more nutritious though less savoury than when cooked in the oven, as by the latter method it is exposed to drier heat. As cold water brings out the juices of the meat, it is advisable to allow the shredded beef to remain in the water for about 15 minutes before commencing to cook it. It should never be boiled to reheat.

Beef-tea contains comparatively little nourishment, but is a popular fluid for invalids as it is palatable and a change from the usual milk feeds.

Benger's Food. For older children and adults. $\frac{1}{2}$ ounce or 1 tablespoonful of Benger's, 2 ounces or 4 tablespoonfuls of cold milk or water.

Mix to a smooth paste in a basin, then add gradually whilst stirring, $\frac{1}{2}$ pint or a breakfast-cupful of boiling milk, or milk and water. Set aside away from the fire for 15 minutes, when the digestive process will have been sufficiently advanced; then pour into a saucepan and slowly heat, stirring constantly till it boils. If the Benger's Food is at all lumpy, which will be the case if it has not been mixed sufficiently slowly and smoothly, the lumps should be broken up by being strained through a sieve, and added to the rest, not thrown away. For invalids with very weak digestions, the self-digestive process may be extended to $\frac{1}{2}$ or $\frac{3}{4}$ hour, but in the majority of cases 15 minutes is usually sufficient. For adults and children over nine months, who are in the habit of taking the food, milk alone may be used in its preparation.

For infants, the proportion of milk and water will vary with the age and condition of the child. Under three months, one-third milk and two-thirds of water should be used, the proportion of the former being gradually increased. Benger's Food as a rule does not require any sweetening.

Bran Bread.* Take about 1 seer (2 pints) of wheat-bran or chokar, boil it in two changes of water for $\frac{1}{2}$ hour, each time straining it through a sieve, then wash it well with cold water (on the sieve) until the water runs off perfectly clear. Squeeze the bran in a cloth as dry as possible, then spread it thinly on a dish and place it in a slow oven; if put in at night, let it remain until morning, when, if perfectly dry and crisp, it will be fit for grinding. The bran thus prepared must be ground in a fine mill and sifted through a wire sieve of such fineness as to require the use of a brush to pass it through; that which remains in the sieve must be ground again until it becomes quite soft and fine.

Take of this bran-powder 3 or 4 ounces, the other ingredients as follows: 4 hen's eggs, 2 ounces of butter, about $\frac{1}{2}$ pint milk. Mix the eggs with a little of the milk, and warm the butter with the other portion, then stir the whole well together, adding a little nutmeg, or ginger, or any other agreeable spice. Bake in small tins (patty tins), which must be well buttered, in a rather quick oven for about $\frac{1}{2}$ hour. The cakes when baked should be a little thicker than ship biscuits. They may be eaten with meat or cheese at breakfast, dinner, and supper;

* From Hare's "Practical Therapeutics".

at tea they require rather a free allowance of butter, or they may be eaten with curd or any of the soft cheeses. In wet weather the cakes tend to become damp; this may be prevented by placing them before a fire for 5 or 10 minutes each day.

The above make a bread suitable for diabetics.

Calves'-feet Jelly. 2 large calves' feet, 5 pints cold water, strained juice of 4 large lemons, rind of 2 lemons thinly pared, $1\frac{1}{2}$ inches of cinnamon, 14 ounces of white sugar, 6 whites of eggs, 3 ounces of cold water, 4 ounces of Madeira.

Place the feet, well washed and split, in the water and boil quickly. Then allow to simmer gently for 6 hours, skimming frequently, after which strain and keep in a cool place till next day. Then remove carefully all the fat which has settled on the top, and put the jelly into a saucepan with the lemon and rind, sugar and cinnamon, and boil up the mixture. The whites of the eggs are then beaten with 3 ounces of cold water and thrown into the jelly, the whole being rapidly whisked with a wire whisk for 20 minutes while boiling rapidly. Then allow to simmer with the saucepan cover off for $\frac{1}{2}$ hour, and strain through a flannel jelly-bag till quite clear. The wine is now added and the jelly poured into moulds and placed on ice and set.

Chicken Cream. A small quantity of boiled chicken, 1 teacupful of milk, pepper and salt to taste, some cream if desired.

Shred finely the breast or wing of a boiled chicken. Then pound it in a mortar. Heat the milk, and add to the chicken by degrees, stirring constantly till of the consistency of thick soup. Flavour with salt and pepper, and add 2 tablespoonfuls of cream. Serve hot.

Beef, mutton, veal, or fish may be treated in the same way, the fat and skin having first been removed. The above are the first articles of meat diet for convalescent enteric patients.

Chicken or Mutton Broth. 1 pound of neck of mutton or 1 chicken, 1 pint of cold water, pepper and salt to taste.

Chop the meat and bone into small pieces. Place in a saucepan with the cold water, pepper and salt, and boil; after which skim to remove the fat, and continue to let the mixture simmer for about $2\frac{1}{2}$ hours. The ingredients can be put into a covered jar placed in simmering water, which is a longer process. All broths should be allowed to boil to bring out the flavour of the meat. When ready, strain, reheat, and serve with chopped parsley if desired. This should first have been

washed and dried, and should be added only at the last moment, or else it will turn brown. When allowed, pearl barley, rice, vermicelli, or semolina may be added to the above broths, but they must have been previously boiled in a small quantity of the broth before being added to the rest.

Sliced vegetables, such as onion, turnip, celery, and a sprig each of thyme, parsley, and marjoram boiled with the broth as seasoning render it more savoury.

Bone and Vegetable Broth.— $\frac{1}{2}$ lb. of beef or mutton bones well broken up and clean of meat.

One handful of sliced vegetables mixed.

Place the bones in a double saucepan, cover with cold water and simmer for 3 hours. After $2\frac{1}{2}$ hours simmering add the vegetables. Strain through boiled muslin into a jug which has been rinsed out with boiling water. Protect from flies and keep in a cool place. The broth must be freshly made daily in hot weather.

Chocolate. 1 ounce of chocolate, 4 ounces of water, 1 pint of milk.

Shred the chocolate and boil for about 5 minutes in the water till quite smooth, then add the cold milk and boil again, stirring quickly to produce a froth. A little cream if desired may be added before serving.

EGGS.

These may be served in various ways, as egg-flip when the patient is unable to take them in any other form; and later in the convalescent stage, they may be given boiled, poached, scrambled, as *œufs au plat*, or as omelette, soufflet, or egg jelly. Fried eggs are not as digestible as any of the above. With boiled or poached eggs, care should be taken to have the whites as lightly set as possible, as otherwise they would be indigestible. For scrambled eggs, or omelettes, a good deal of beating of both the yolk and whites is necessary to render the result light.

Coddled Egg. This is a favourite way with Americans of serving eggs. It is certainly very digestible, though by English people it may be considered to be too insufficiently cooked to be palatable.

Break the egg into a custard-glass, preferably one with a short stem, or into a small cup, and place the glass into a basin of hot water till the white of the egg is slightly set, when serve with pepper and salt.

Egg Flip. 1 to 2 eggs, according to size; $\frac{1}{2}$ to $\frac{1}{2}$ pint of fresh cold milk, sifted sugar to taste, some flavouring.

Break the yolks of the eggs into a large cup or basin, and beat with a fork, gradually adding the milk and the sugar. Then strain into a tumbler; adding $\frac{1}{2}$ ounce of brandy or 1 ounce of port wine, or some strong coffee, or a few drops of lemon or vanilla essence. Beat the whites on a plate with a knife into a stiff froth, adding a little sugar while doing so. Pour on to the milk, and serve with a little grated nutmeg over the top. The latter can be omitted if not desired.

If required to be served in a feeding-cup, the entire egg should be beaten up in a cup, and then strained, the sugar, and brandy if ordered, being added afterwards.

Eufs au plat. 1 egg, a little butter, pepper and salt.

Put a little butter, about a teaspoonful, in a saucer or in a ramequin dish and keep on the oven or over boiling water till it is melted. Then break the egg into it, taking care that the yolk remains whole, and keep hot till the white is lightly set. Serve with pepper and salt sprinkled over it, and a little chopped parsley if desired.

This is a very palatable way of serving eggs. Grated cheese may also be used over it.

Omelette Soufflet. 3 whites of eggs, 2 yolks, $\frac{1}{2}$ teaspoonful of flour, $1\frac{1}{2}$ ounces of sugar (sifted), and any kind of flavouring

Beat up the yolks, and add the flour, sugar, and flavouring. Beat the whites into a stiff froth on a plate with a knife, and put it into the mixture, which afterwards is poured into a well-buttered tin and baked in the oven till of a light brown colour. Serve at once in the tin with a little sugar sprinkled over it.

Grated Breadcrumbs. Slices of bread, from which the crust has been removed, are baked in an oven until quite dry and brown, and then grated finely on a nutmeg grater.

These crumbs are more easily digested than ordinary breadcrumbs, and so are suitable for an enteric patient as one of his first advances on to solid food.

Gruel. $\frac{1}{2}$ to 1 pint of boiling milk or water, $\frac{1}{2}$ tablespoonful of fine oatmeal or patent groats.

Mix the oatmeal with a little cold water or milk into a smooth paste. Then add to the remainder of the boiling milk or water, and continue to boil until the mixture becomes thick, stirring constantly. If required in a more fluid form, the

milk or water can be increased. Gruel should be served hot. Brandy, rum, sugar, or salt may be added if desired.

Barley Gruel. 1 tablespoonful of Patent Barley Flour, $\frac{1}{2}$ pint of boiling water or milk, a pinch of salt.

Mix the barley flour and salt with a little cold water to a smooth thick paste. Add the boiling milk or water, and allow to simmer for 10 minutes, stirring constantly.

Sugar to taste may be added.

Imperial Drink. 1 large tablespoonful of cream of tartar (acid potassium tartrate), 1 pint of boiling water, some sugar, and lemon-peel as flavouring.

Dissolve the cream of tartar in the boiling water and add the sugar and flavouring. Strain and serve when cold.

Junket. 1 pint of fresh milk, 1 to 2 teaspoonfuls of essence of rennet, 1 ounce of sifted sugar.

Heat the milk and sugar till lukewarm. Pour into the dish in which the junket will be served, then add the rennet. When set it is ready to serve. Some whipped cream placed over the junket, or a little grated nutmeg or lemon-peel is to some a palatable addition.

Lemonade. $\frac{1}{2}$ pint of boiling water, 1 lemon cut up into slices, the thinly pared rind of 1 lemon, and sugar to taste.

Mix all with the boiling water. Allow to remain till cold, when strain and serve.

Liver Soup. Take $\frac{3}{4}$ lb. of fresh calf's or ox liver; mince finely and steep in 2 pints of water; simmer for 3 hours, add a little tapioca or sago and pepper and salt. Strain and give half a pint twice a day. Marmite (a preparation of yeast) may be added to the soup—2 teaspoons to $\frac{1}{2}$ a pint—in which case added salt will not be necessary.

Meat Extracts. Valentine's Meat Juice. Liebig's, Panopepton, Bovril, and Brand's Essence of Mutton or Chicken are all useful when milk cannot be tolerated. The directions are supplied with each.

Valentine's Meat Juice is usually given in the proportion of 1 teaspoonful to 8 of water, and should be given cold.

Panopepton, 4 to 8 teaspoonfuls; Brand's Essence, 1 teaspoonful at a time, either as a jelly, having been set on ice, or diluted with water to 8 teaspoonfuls.

Liebig's Extract of Meat is most palatable when served hot. A little lemon juice as flavouring is often appreciated. Patients with a distaste for milk can sometimes tolerate it if it is mixed with a little Liebig.

It must not be thought, however, that meat extracts are valuable as foods ; their use is mainly stimulant.

MILK PREPARATIONS.

Milk Posset. Cut 2 thin slices of bread in squares and put in a bowl. Sprinkle over it a pinch of salt and a little nutmeg. Pour in a pint of boiling milk and let stand near a fire for 10 minutes. Then stir in 1 tablespoonful of sherry or brandy.

Milk Tea. Warm a teapot thoroughly. Put in the tea and a very little water to cover it. Let stand 5 minutes. Then pour in boiling milk and let stand for 3 minutes more.

Milk with Meat Essence. Prepare any meat essence with milk instead of water. This beverage is very nourishing and digestible.

Honey and Milk. Stir a teaspoonful of honey into a cup of hot milk. This is very soothing when one has a cold in the head.

Milk and Rice Soup. Soak 2 ounces of rice for 12 hours. Simmer in 1 pint milk for 2 hours. Then boil for 1 hour. Beat in the yolks of 2 eggs and a small piece of butter, and add pepper and salt.

Milk Jelly. $\frac{1}{4}$ to $\frac{1}{2}$ ounce of gelatine, $\frac{1}{2}$ pint of milk, 2 ounces of sifted sugar. For flavouring, the thinly pared end of half a lemon, or cinnamon, cloves, or any kind of essence.

Place the milk, gelatine, sugar, and lemon-rind in an enamel saucepan over a moderate fire till the gelatine is quite dissolved. Do not allow it to boil. Then strain and place it in a cool place to cool, stirring occasionally.

When cool pour into basin or mould, previously dipped for a moment into cold water, and allow to remain till set. When ready, dip the mould quickly in hot water to loosen the jelly and turn out on the dish in which it is to be served. Some cream may be served with the milk jelly if desired.

Skimmed Milk. Place one pint of milk in a shallow vessel ; simmer for one hour, cover carefully and set aside in a cool place preferably the ice box for 4 hours ; skim off the cream with a large tablespoon which has been previously boiled, to render sterile, the remaining milk to be used. Alternatively simmer the milk in an ordinary douche can placed in boiling water, then set aside as before and run off $\frac{3}{4}$ of the milk, leaving the upper layers containing the cream in the douche can.

Lactic acid milk. To one pint of milk which has been previously brought to the boil and then cooled, add 45 drops of

lactic acid (British Pharmacopœia) drop by drop, stirring all the time.

N.B.—(The acid must not be added to hot milk, and skimmed milk may be used instead of whole milk.)

Peptonised Beef-tea. $\frac{1}{2}$ pound finely minced beef, 20 grains sodium bicarbonate, 1 pint cold water.

Let this mixture simmer for $1\frac{1}{2}$ hours, and when cooled to about 140° F. (as hot as the finger can comfortably bear) add Liquor Pancreatis B.P., or Benger's Liquor Pancreatis, 2 drachms, or Armour's Extractum Pancreaticus, 5 grains; keep the mixture warm in front of the fire for 2 hours with occasional stirring, then strain and boil.

Peptonised Milk. (a) 1 pint of cold fresh milk, $\frac{1}{2}$ pint boiling water, 5 grains Extractum Pancreatis (Armour's), 10 grains sodium bicarbonate.

Add the boiling water to the milk, and having dissolved the Extractum Pancreatis and sodium bicarbonate in a small quantity of the mixture, add them to the rest. Keep warm in front of the fire for 10 minutes and then bring to the boiling-point.

Two teaspoonfuls of Liquor Pancreatis with 20 grains of sodium bicarbonate may be used in the same way for peptonising milk.

(b) Peptonised milk made with Fairchild's Zymine Peptonising Powder. 1 pint fresh cold milk, 1 tube of Zymine Powder, $\frac{1}{2}$ pint of cold water.

Mix the powder very gradually and smoothly with the cold water and add the milk which has previously been made lukewarm. Allow the mixture to remain in a warm place for 10 minutes for the predigestion of the milk, then bring to the boiling-point. If further predigestion is required the time for this process can be extended by 5 minutes, or even longer.

Peptonised milk should be made twice in the twenty-four hours, and should be kept in a cool place, being reheated if required or given cold.

Boiling stops further predigestion. A similar result could be obtained by keeping the milk constantly on ice, but this is not quite so safe a method.

Fairchild's Peptonising Powders are useful for peptonising a variety of foods for the invalid, directions for which will be found enclosed in every box of the powders.

Raw Meat Juice. $\frac{1}{4}$ pound of lean beef or mutton, 1 tablespoonful of cold water to every ounce of meat.

Shred the meat very finely after removing skin and fat. The water and a little salt are then added and the mixture stood in a basin of warm water for about 1 hour, after which strain and serve. It may be flavoured with a slice of lemon or a little claret if permitted.

For children six to twelve months old it should be given without flavouring, but with a little sugar; the dose being 1 to 4 tablespoonfuls in the twenty-four hours.

Infusions of raw meat should be kept in a cool place, preferably on ice, and should be made freshly every 12 hours as they are apt to go bad. They should be given cold.

In preparing all meat for beef-tea it is advisable not to use the mincing-machine for shredding it, except for very large quantities, as a certain proportion of the juices of the meat are lost by this method. Also when straining, the meat should be well squeezed in the strainer or piece of muslin used, so as to extract as much juice as possible.

Raw Meat Sandwiches. These are prepared from about 1 ounce to 2 ounces of lean beef or calves liver, finely shredded, the fat and skin having been removed. The meat is spread between 2 thin slices of bread and butter like a sandwich. A little salt, and pepper if allowed, may be used as flavouring, and a little lemon juice.

Grated cod-roe, or a small quantity of anchovy sauce or paste helps to disguise the raw flavour of the meat.

Sago. $\frac{1}{4}$ ounce of sago, $\frac{1}{2}$ pint of cold water or milk, some sugar.

Boil the sago and the water or milk for 1 hour, stirring frequently. Sweeten to taste, and add brandy or wine if ordered.

Tapioca. $\frac{1}{4}$ ounce of tapioca, 1 pint of milk.

Proceed as with sago, but boil for 2 hours.

Whey (Rennet). 1 pint of unboiled milk, 1 teaspoonful of essence of rennet.

Heat the milk to a temperature of about 105° F., add the rennet, and set aside in a warm place till the curd has set, then strain through muslin, and the whey is ready.

A quicker method to make whey is to boil the milk as soon as it begins to set; this hastens the formation of curds, which set into a solid mass, and all the whey possible is obtained when straining, but the character of the whey is not quite the same as by the first method.

Whey may be used for the purpose of diluting milk, in the

same way as barley-water, and in similar proportions.

White Wine Whey, and Lemon Whey. Take $\frac{1}{2}$ pint of milk and heat it nearly to boiling-point; add 2 ounces of cooking sherry, and let the mixture simmer until the curd has separated, then strain.

Lemon whey is made similarly by adding 1 teaspoonful of lemon juice to $\frac{1}{2}$ pint of milk.

Both the above may be served hot if desired.

CHAPTER XXII

DISINFECTION AND DISINFESTATION

It used to be thought that the germs of disease floated about in the air as do motes in a ray of sunlight, and that infection spread from person to person through the medium of an atmosphere contaminated by the infected particles. This theory accounts for the name "malaria", the Italian for "bad air"; it being thought that the disease arose from the unwholesome atmosphere exhaled from swamps.

We now know that, while there is a group of diseases, the *Respiratory Group*, in which the infection commonly passes from person to person through the atmosphere, this is not by any means the only or even the most frequent mode of disease transmission nor, in this group of diseases, do we ever get the whole atmosphere contaminated and therefore dangerous. In the *Respiratory Group* of diseases of which the common cold, influenza, pulmonary tuberculosis and the fatal pneumonic type of plague are examples, the air in the immediate vicinity of the infected person is polluted by sneezing and coughing which cause a fine spray of droplets of moisture laden with disease germs to be propelled into the air for a distance of 3-4 feet. This is known as "droplet infection", and a clear comprehension of the mechanism of infection in this group of diseases, as in the other groups, is the key to an understanding of the methods of disinfection which should be adopted.

Other groups are : the *Alimentary Group*, including cholera, typhoid, dysentery and the food infections, where the infective germs are present in the excreta, which therefore require to be disinfected; the *Contact Group*, including the venereal diseases, where infection is spread from person to person by direct contact; and the *Inoculation Group*, in which the infective agent or virus is introduced into the body, usually by a biting insect, and in which therefore our object is the destruction of all such infected insects, a process more properly described as *disinfestation* or *disinsection*.

True Disinfectants destroy the infective germs or specific virus of disease. The term *Antiseptic* is used to express a less radical idea : antiseptics prevent, arrest or impede the growth or multiplication of disease germs without necessarily destroying them. Practically all antiseptics however, if used strong enough, are true disinfectants. A *Deodorant* on the other hand merely destroys or masks offensive odours. Sunlight and fresh air are the best of all deodorants ; they arrest the growth of disease-causing microbes and, in favourable circumstances, are capable of destroying them.

Disinfection and disinfestation may be brought about by various agencies, natural or artificial. They are :

1. Light and air.
2. Heat.
3. Chemicals.

Light and air. Sunlight and fresh air are not only the best deodorants, but they are also Nature's disinfectants and should be made use of. Free ventilation and exposure to sunlight by themselves will remove the danger of infection in many diseases. Fresh air disinfects, by virtue of the oxygen contained in it, while sunlight kills many germs by photo-chemical action. Infected bedding and blankets and clothing hung up in the open air in bright sunlight for several days become freed from the virus of most human diseases. These natural agents cannot however be relied upon to kill those microbes which form resistant spores. It is also not possible in some cases to obtain sufficient sun and air in the interior of buildings.

Heat. Disinfection by heat is simple and safe. Articles of little value should be burned. Many articles of clothing and bedding and metal utensils can be boiled. This method can also be used for the infective excreta in cases of cholera and enteric fever. Steam, either current steam as given off from boiling water or steam under pressure, is a valuable disinfectant used in hospitals and disinfection stations. The articles to be disinfected are removed and placed in large steam sterilisers. This method however damages leather goods, books and other delicate articles.

Chemical. These may be used in the form of gases, liquids or solids.

Gases. The old idea that disease germs floated about in the air naturally gave rise to a desire to disinfect the atmosphere, and for this purpose various chemical gases were used

as *Fumigants*, and the method of fumigation of rooms after the occurrence of infectious disease, became general. The gases given off from burning sulphur, chlorine which in its pure state is a gas, and formic aldehyde given off from *formalin solution* were those commonly used. Now-a-days we realise that in a quiet atmosphere germs, like all other solids, tend to fall and to collect upon flat surfaces in the dust which gathers there. Our efforts therefore are directed towards the disinfection of surfaces, and we only need to use fumigation in cases where it is difficult or impossible to reach surfaces by other means. Thus the holds of ships are frequently fumigated with the gases of burning sulphur or the more dangerous cyanide gas, to kill the rats and fleas responsible for the spread of plague, while formalin vapour is used in cupboards or special chambers, to disinfect books, leather goods and fabrics which are damaged by other methods.

Liquids. These are convenient and reliable in use. Solutions of various powerful disinfectants are prepared, and infected articles immersed or sprayed with *Carbolic acid*, *Cyllin*, *Izal*, *Kerol*, *Hycol*, *Jeyes-fluid* or *Sanitas*, all these being examples of reliable liquid disinfectants suitable for most purposes.

Potassium permanganate of *Potash* in weak solution is much used but is not so reliable as those mentioned above. In India, *Potassium permanganate* has been much used for washing fruit and salad and for disinfecting wells. For neither purpose is it really safe. *Fruit and salads* are best dipped for a moment or two in actively boiling water, while chlorine used in the form of *Tropical Chloride of Lime* is the best sterilising agent for wells and tanks: from 2 to 8 ounces of the powder, according to the size of the well (about two teaspoons per 100 gallons), should be mixed in a bucket of water, which should then be lowered to the bottom and raised and lowered several times to ensure complete mixing. In a properly disinfected well, a sample of the water drawn half an hour after adding the *Tropical Chloride of Lime* should smell distinctly of chlorine. Unfortunately Chlorine is a powerful bleaching agent and is therefore unsuitable for use with coloured fabrics. *Formalin*, which is a 40 per cent. solution of *Formic aldehyde* in water, is a useful disinfectant solution. It is applied in the strength of 1 in 10 as a spray or 1 in 20 for immersion and can be used on nearly all articles.

The best liquid disinfectant to use in a plague infected house

is *Crude Oil* or *Kerosene oil* smeared or sprayed over the floors and walls. The *Kerosene oil* may be diluted (one quart to a kerosene oil tin), by stirring it little by little into boiling water in which a cake of soap has been dissolved.

Corrosive sublimate or perchloride of mercury is a powerful solid disinfectant used in solutions of 1 in 1000 to 1 in 5000. It is intensely poisonous and therefore unsuitable for general use.

For the hands *Lysol* (1 teaspoonful to the pint) or *Carbolic Acid* (1 in 40) are the best.

For liquid disinfection of *clothing, bedding, &c.*, if boiling or steam disinfection is impracticable, immerse for several hours in a solution of *Cyllin, Izal, Jeyes' fluid, Hycol* or *Kerol*, 1 in 50, washing afterwards with soap and water. The same solution may be used for washing *furniture, floors, walls* and *wood work of rooms*. Walls alternatively may be limewashed with *Tropical Chloride of Lime*.

Discharges such as *sputum, urine* and *fæces*, if not burned, may be mixed with equal parts of *Carbolic acid* (1 in 20) or *Cyllin, Izal, Hycol*, or *Jeyes' fluid* (1 in 50) or, best of all, *Tropical Chloride of Lime* (4 oz. to 1 gallon).

Utensils used by the sick are best placed in actively boiling water for fifteen minutes

Books and Boots are best disinfected with *Formalin vapour* in a closed cupboard.

The *body* of a person who has died from infectious disease should be washed with *Carbolic acid* solution (1 in 20).

Tincture of Iodine is the best disinfectant for small *cuts* and *abrasions* of the skin.

Solids. These are not used to any extent. Keating's powder for insect pests, and chloride of lime powder for admixture with *fæces* are about the only two requiring mention.

CHAPTER XXIII

PRESCRIPTIONS

The preparations of drugs referred to in this chapter are those of the British Pharmacopœia.

1. ISAPGHUL

Two and a half drachms of the seeds, obtainable in any bazar, are allowed to simmer in water for half an hour. The resultant sticky mass is then strained through cloth to remove the husks of the seeds. The remainder, about a cupful in quantity, may then be sweetened and flavoured with vanilla or lemon to taste. This amount may be taken twice or thrice daily, and is very useful in the convalescent stages of diarrhoea and dysentery.

If there is difficulty in taking it when cold, because of its stringiness, it may be warmed.

2. LIME WATER

Lime water is usually bought ready prepared from a druggist. It may, however, be made in the following simple way : Add a piece of unslaked lime, the size of a walnut, to two quarts of boiled and filtered water. After stirring it thoroughly, allow to settle and pour off the clear fluid into a bottle. More water may then be added to the lime until it is all used.

LOCAL APPLICATIONS FOR GENERAL USE

4. ACONITE PAINT

Tincture of iodine 1 drachm

Liniment of aconite 1 drachm

An anodyne paint ; used to relieve tenderness over the course of a nerve, as in neuralgia.

5. BELLADONNA PAINT

Green extract of belladonna 1 drachm

Glycerine 1 drachm

Used to relieve pain over a chronically inflamed area.

6. BORIC FOMENTATION

Boric lint to be dipped in boiling water, and wrung out by putting it in a towel and twisting the towel ends, and then applied. Cover with gutta-percha tissue or oiled paper, cotton-wool and a bandage.

A useful fomentation over any inflamed area ; especially useful over a septic wound.

7. CHROMIC ACID PAINT

Chromic anhydride	.	.	.	.	.	30 grains
Water to	.	.	.	.	.	1 ounce

May be used to paint fissures or ulcers of the tongue.

8. EMULSION OF IODOFORM

Iodoform in one powder	.	.	.	.	1 ounce
Water	.	.	.	.	2 ounces
Glycerine to	.	.	.	.	10 ounces

Sterilise before use.

Strips of gauze saturated with this form a suitable dressing for a septic wound ; especially useful for tuberculous wounds.

9. IODINE PAINT

Iodine	.	.	.	.	.	30 grains
Glycerine	.	.	.	.	.	1 ounce

A paint suitable either as a counter-irritant over a chronically inflamed area or as a means of cleansing the skin.

10. LINSEED POULTICE

Crushed linseed	.	.	.	.	4 ounces
Boiling carbolic lotion, 1 in 60	.	.	.	.	10 ounces

Add the boiling lotion to the crushed linseed little by little while stirring.

This poultice is suitable for use over any inflamed area, but especially where the skin is unbroken. Used also to relieve pain in pneumonia and pleurisy.

11. SOLUTION OF PICRIC ACID

Picric acid	.	.	.	.	2 grains
Water	.	.	.	.	1 ounce

Lint dipped in the above forms an excellent dressing for burns or other superficial wounds where there is much serious discharge from the skin.

12. TANNIC ACID AND GLYCERINE PAINT

Tannic acid	320 grains
Glycerine	1 ounce

This paint may be applied over tonsils or the pharynx when those parts are chronically inflamed.

LOTIONS**13. BINIODIDE AND SPIRIT LOTION**

Perchloride of mercury	10 grains
Iodide of potassium	30 grains
Eosin (not necessary)	a trace
Water	5 ounces
Methylated or rectified spirit	15 ounces

An excellent antiseptic lotion for cleansing the skin preparatory to an operation.

14. BORIC ACID LOTION

Boric acid	6 drachms
Pink dye (not necessary)	a sufficiency
Boiling water	20 ounces

Dissolve the acid in the water, filter, and then boil the solution.

A mild antiseptic lotion.

15. CALAMINE LOTION

Prepared calamine	1 ounce
Oxide of zinc	1 ounce
Glycerine	1 ounce
Lime water to	20 ounces

A sedative lotion, useful in eczema or similar irritated conditions of the skin.

16. CARBOLIC LOTION

Pure carbolic acid	1 ounce
Hot water to	20 ounces

Add the water in small quantities to the acid and shake thoroughly after each addition.

Most useful antiseptic lotion : in the above strength is used for sterilising instruments or the skin before an operation. Half or a third of the above strength is suitable for use on open wounds or to make a fomentation with. A quarter of the above strength for use in mucous cavities such as the mouth.

17. EVAPORATING LOTION

Solution of ammonium acetate	.	.	.	.	2½ ounces
Ammonium chloride	.	.	.	.	½ ounce
Methylated spirit	.	.	.	.	5 ounces
Water to	.	.	.	.	20 ounces

A cooling lotion : lint dipped in this may be applied over a recently injured part, or to relieve the pain of acute inflammation over some parts, such as the knee.

18. PERCHLORIDE LOTION

Perchloride of mercury	.	.	.	.	8½ grains
Sodium chloride	.	.	.	.	8½ grains
Blue dye (not necessary)	.	.	.	.	a trace
Water	.	.	.	.	2 ounces

Dissolve ; strength 1 in 250.

A strong antiseptic lotion. Instruments should not be placed in this lotion. For use on the unbroken skin half the above strength is suitable ; for use in wounds or in mucous cavities one-eighth of the above strength, i.e., 1 in 2000, is suitable.

19. PERMANGANATE LOTION

Permanganate of potash	.	.	.	.	20 grains
Water to	.	.	.	.	20 ounces

An excellent mild antiseptic lotion : useful as a mouth-wash, or vaginal douche, or as an enema.

MOUTH-WASHES

20. ALUM MOUTH-WASH

Powdered alum	.	.	.	.	7 grains
Water to	.	.	.	.	1 ounce

As a mouth-wash or gargle.

An astringent mouth-wash : useful for tender gums. Mixed with an equal quantity of warm water can be used as an ear lotion.

21. CHLORATE GARGLE

Potassium chlorate	.	.	.	.	10 grains
Water to	.	.	.	.	1 ounce

As a gargle or mouth-wash.

A very good gargle for a septic sore throat, or as a mouth-wash for suppurating gums.

SURGICAL DRESSINGS

Where there is a shop it will be much better to buy these dressings ready made by a trustworthy firm than to make them oneself.

22. ABSORBENT COTTON

Commercial carbonate of soda	. . . . .	2 ounces
Water	. . . . .	1 gallon

Dissolve.

Two pounds cleaned and ginned cotton. Immerse the cotton in the solution. Heat and allow to simmer slowly for three hours. Rinse the wool in running water until all alkali is removed. Squeeze as dry as possible. Spread out to dry. Tease and card. Store in a dust-proof receptacle. Sterilise before use.

Generally useful as a dressing or as a pad over dressings. It will be better to buy this material ready made.

23. BORIC LINT

Pass lint through hot saturated solution of boric acid.

Squeeze gently to remove excess of water. Dry and fold.

A mild form of dressing: useful also for fomenting septic wounds. Better bought ready made.

24. CYANIDE GAUZE

Take of (by weight) 3 per cent. solution of double cyanide of mercury and zinc in distilled water. Immerse moistened prepared gauze (*see* No. 26). Knead. Wring out excess solution.

Dry and fold.

This is better bought ready made.

25. IODOFORM GAUZE

Iodoform in powder	. . . . .	10 parts by weight
Solution of hard soap	. . . . .	90 parts

Stir the iodoform into the emulsion. Immerse the gauze. Knead thoroughly. Spread out in a dark room to dry. Fold when slightly moist. Store in glass jars.

This forms a suitable dressing for septic wounds, especially if there is much discharge of pus. Or for wounds near a part likely to become fouled, such as a fistula in ano. May be bought ready made.

26. PREPARED GAUZE

Preparation of gauze for surgical dressings.

1. Wash thoroughly with soap and hot water.
2. Rinse in clean water.
3. Dry the gauze.
4. Weigh one length of gauze.
5. Saturate one length in water.
6. Collect all the water which can be squeezed out of the saturated length.
7. Measure the water squeezed out. This gives the correct quantity of fluid necessary for medicating one length of gauze.
8. Dry the gauze.
9. Fold each length into six thicknesses.
10. Roll up lightly.
11. Sterilise before use.

Gauze (mullum from the bazar) treated as above will form a suitable dressing for wounds. It may be bought ready made.

DRAUGHTS

27. APERIENT DRAUGHT

Magnesium sulphate	.	.	.	.	.	3 drachms
Spirit of chloroform	.	.	.	.	.	7½ minims
Infusion of senna to	.	.	.	.	.	1 ounce

A mild saline aperient suitable for taking early in the morning or to assist an overnight pill. Comparable to the old-fashioned 'Black Draught.'

28. CALCIUM PERMANGANATE DRAUGHT

Calcium permanganate	.	.	.	.	.	4 grains
Water	.	.	.	.	.	1 pint

To be used either undiluted or dilute up to eight times its volume as a drink in cases of cholera.

To be given 2 or 3 ounces at a time very frequently. If vomited give it again.

29. CHLORAL AND BROMIDE DRAUGHT

Chloral hydrate	.	.	.	.	.	15 grains
Potassium bromide	.	.	.	.	.	20 grains
Simple syrup	.	.	.	.	.	1 drachm
Water to	.	.	.	.	.	1 ounce

A strong hypnotic or sedative draught. Useful to quiet a patient with tetanus or hydrophobia or under medical advice only in insomnia. Useful for some forms of delirium. Do not give it in pneumonia or bronchitis. Also useful for convulsions in children in doses suitable to their age.

30. EMETIC DRAUGHT

Zinc sulphate	.	.	.	.	.	.	30 grains
Water to	.	.	.	.	.	.	1 ounce

A powerful emetic; especially used to remove poisons from the stomach where a stomach-pump is not available.

31. MALE FERN DRAUGHT

Liquid extract of male fern	.	.	.	.	.	1 drachm
Gum acacia powder	.	.	.	.	.	1 drachm
Peppermint water to	.	.	.	.	.	1½ ounces

To be followed by a saline purge.

A draught to expel a tapeworm.

32. PARALDEHYDE DRAUGHT

Paraldehyde	.	.	.	.	.	1 drachm
Syrup of orange	.	.	.	.	.	1 drachm
Water to	.	.	.	.	.	1 ounce

A hypnotic draught. Nauseous in taste; but the least harmful of hypnotics.

MIXTURES

The dose of each mixture is 1 ounce for an adult unless otherwise stated: see page 6 for proportionate dosage for the young.

33. ACID MIXTURE

Dilute nitrohydrochloric acid	.	.	.	.	12 minims
Infusion of chiretta to	.	.	.	.	1 ounce

To be taken with or after food. Useful in some forms of dyspepsia:

34. AROMATIC ACID MIXTURE

Dilute hydrochloric acid	.	.	.	.	7 minims
Compound spirit of horseradish	.	.	.	.	10 minims
Tincture of ginger	.	.	.	.	10 minims
Infusion of chiretta to	.	.	.	.	1 ounce

35. ALKALINE CHIRETTA MIXTURE

Sodium bicarbonate	.	.	.	.	10 grains
Light magnesium carbonate	.	.	.	.	10 grains
Infusion of chiretta to	.	.	.	.	1 ounce

.. Taken before meals to promote appetite and in some forms of dyspepsia. May be taken after meals for acidity.

36. ACID QUININE MIXTURE

Quinine sulphate	.	.	.	.	.	5 grains
Diluted sulphuric acid	.	.	.	.	.	6 minims
Water to	.	.	.	.	.	1 ounce

Invaluable in malaria ; and in half the above dose may be used for fever due to other causes.

37. STRONG QUININE MIXTURE

Quinine sulphate (or cinchona febrifuge)	.	.	10 grains
Citric acid	.	.	30 grains
Water to	.	.	1 ounce

Any flavouring mixture preferred may be added.

38. ÆTHER AND AMMONIA MIXTURE

Aromatic Spirits of Ammonia	.	.	.	} 30 minims of each
Spirit of æther	.	.	.	
Camphor	.	.	.	1 grain
Water to	.	.	.	1 ounce

Adult dose : one ounce to be taken every four hours.

A stimulant mixture : useful in heart failure and shock and on other occasions.

39. AMMONIA, IPECACUANHA, AND OPIUM MIXTURE

Tincture of opium	.	.	.	.	5 minims
Ipecacuanha wine	.	.	.	.	10 minims
Ammonium carbonate	.	.	.	.	3 grains
Chloroform water to	.	.	.	.	1 ounce

A sedative expectorant : useful in pleurisy or in phthisis where the cough is excessive. Do not give in bronchitis, if there is much expectoration.

40. AMMONIA, SQUILLS, AND SENEGA MIXTURE

Ammonium carbonate	.	.	.	.	5 grains
Spirit of chloroform	.	.	.	.	15 minims
Tincture of squills	.	.	.	.	8 minims
Infusion of senega to	.	.	.	.	1 ounce

A stimulant expectorant : generally useful as a cough mixture. Do not give in the early stages of pneumonia or if there is nausea.

41. COMPOUND AMMONIUM ACETATE MIXTURE**SYN : DIAPHORETIC MIXTURE**

Solution of ammonium acetate	3 drachms
Spirit of nitrous æther	20 minims
Potassium nitrate	10 grains
Water to	1 ounce

A mixture to promote mild sweating and relieve the hot stages of fevers.

42. BISMUTH MIXTURE

Bismuth carbonate	15 grains
Light magnesium carbonate	10 grains
Sodium bicarbonate	10 grains
Mucilage of tragacanth	1 drachm
Chloroform water to	1 ounce

This mixture in doses of 1 drachm is also suitable for infants.

A stomach and bowel sedative : useful for many forms of dyspepsia and diarrhoea. Will colour the motions black.

43. CASTOR OIL EMULSION

Castor oil	40 minims
Powdered gum acacia	20 grains
Compound tincture of cardamons	20 minims
Peppermint water to	1 ounce

Rub the oil and the gum together and add the liquid constituents drop by drop triturating very thoroughly until a milky emulsion is obtained.

In doses of 1 drachm thrice daily this is suitable also for infants.

Useful in dysentery and in irritant forms of diarrhoea. Especially useful for mucous diarrhoea in children and during teething trouble. Given thrice daily in above doses to infants, this will have a constipating effect.

44. CHALK MIXTURE

Prepared chalk	15 grains
Powdered gum acacia	15 grains
Cinnamon water to	1 ounce

A sedative and mildly astringent mixture. Useful in some forms of diarrhoea.

45. CHLORINE MIXTURE

Potassium chlorate	.	.	.	.	.	30 grains
Hydrochloric acid	.	.	.	.	.	40 minims

Mix and allow to stand five minutes, then gradually add water to 12 ounces, shaking well after each addition :

Then add :

Syrup of orange	1 ounce
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Used as an intestinal antiseptic. Used by some as a routine treatment during enteric fever.

46. CITRATE AND SQUILL MIXTURE

SYN. : DIURETIC MIXTURE

Potassium citrate	.	.	.	.	.	30 grains
Tincture of hyoscyamus	.	.	.	.	.	20 minims
Spirit of nitrous ether	.	.	.	.	.	20 minims
Tincture of squill	.	.	.	.	.	15 minims
Infusion of buchu to	.	.	.	.	.	1 ounce

A mixture used to promote a free excretion of urine.

47. COD-LIVER OIL EMULSION

Cod-liver oil	.	.	.	.	.	2 drachms
Oil of cinnamon	.	.	.	.	.	2 minims
Sugar	.	.	.	.	.	30 grains
Mucilage of gum acacia	.	.	.	.	.	3 drachms
Peppermint water to	.	.	.	.	.	1 ounce

To be made in a manner similar to the castor oil emulsion.

Children under 12 years of age may be given 2 teaspoonfuls three times a day.

A good way of giving cod-liver oil : used in phthisis and in other wasted conditions.

48. COPAIBA MIXTURE

Copaiba	.	.	.	.	.	20 minims
Solution of potash	.	.	.	.	.	10 minims
Mucilage of acacia	.	.	.	.	.	2 drachms
Water to	.	.	.	.	.	1 ounce

An antiseptic for the urinary and respiratory tracts. Used in gonorrhoea and in septic bronchitis.

49. DIGITALIS AND IRON MIXTURE

Tincture of digitalis	10 minims
Tincture of perchloride of iron	10 minims
Syrup of lemon	30 minims
Citric acid	5 grains
Water to	1 ounce

A heart tonic : used in some forms of heart disease.

50. ERGOT MIXTURE

Liquid extract of ergot	30 minims
Glycerine	20 minims
Chloroform water to	1 ounce

To promote uterine contractions. Used after labour and in some forms of painful menstruation.

51. IRON AND MAGNESIUM SULPHATES MIXTURES

Ferrous sulphate	2 grains
Magnesium sulphate	30 grains
Quinine sulphate	3 grains
Dilute sulphuric acid	8 minims
Water to	1 ounce

This mixture is also suitable for infants in doses of 1 drachm.

An iron tonic. Used also for some forms of splenic enlargement such as those due to malaria.

52. IRON AND QUININE MIXTURE

Quinine sulphate	2 grains
Tincture of perchloride of iron	10 minims
Tincture of nux vomica	4 minims
Diluted hydrochloric acid	5 minims
Water to	1 ounce

An excellent general tonic. Should be taken after food. Especially useful in convalescing from a long illness.

53. COMPOUND LINCTUS

Dilute sulphuric acid	2 minims
Syrup of squills	4 minims
Golden syrup or treacle	8 minims
Compound tincture of camphor	16 minims
Anise water to	1 drachm

Dose : 1 drachm.

A useful mixture, a teaspoon at a time, to allay a tickling cough. Do not give more than six times in the twenty-four hours

54. STRONG MAGNESIUM SULPHATE SOLUTION

Magnesium sulphate	6 drachms
Water to	1 ounce

An ounce of this may be taken as a purgative. Taken in teaspoon doses is excellent for some forms of dysentery : a teaspoon every hour till blood stops coming ; thenceforward three-hourly till mucus stops also. Glaubers Salt, Sodium Sulphate may be substituted.

55. POTASSIUM BROMIDE MIXTURE

Potassium bromide	10 grains
Chloroform water to	1 ounce

A sedative mixture. Useful for some forms of headache especially those due to worry : used in epilepsy : as a mild hypnotic if no pain is present.

56. POTASSIUM IODIDE MIXTURE

Potassium iodide	5 grains
Ammonium carbonate	3 grains
Chloroform water to	1 ounce

Used for chronic bronchitis and in asthma where there is difficulty in bringing up phlegm. Invaluable in tertiary syphilis. Should not be given for more than a day or so except under medical observation.

57. RHUBARB AND SODA MIXTURE

Sodium bicarbonate	10 grains
Oil of peppermint	$\frac{1}{2}$ minim
Spirit of chloroform	5 minims
Infusion of rhubarb	2 drachms
Compound infusion of gentian to	1 ounce

Excellent for some forms of dyspepsia, especially for acid dyspepsia with flatulence.

58. SODIUM SALICYLATE MIXTURE

Sodium salicylate	8 grains
Potassium bicarbonate	15 grains
Chloroform water	1 ounce

Used in rheumatism and for other joint and muscular pains. Sometimes used as an intestinal antiseptic.

59. SULPHURIC ACID AND OPIUM MIXTURE

Dilute sulphuric acid	15 minims
Tincture of opium	7 minims
Spirit of chloroform	15 minims
Camphor water to	1 ounce

A powerful astringent and sedative for the intestine. May be used early in diarrhoea when cholera is prevalent if the attack is mild. Do not give it for rice-water stools, nor for dysentery.

60. WHITE MIXTURE

Magnesium carbonate	10 grains
Magnesium sulphate	1 drachm
Peppermint water to	1 ounce

A very useful saline aperient. Taken thrice daily, is used for some forms of dyspepsia and for constipation.

61. ESSENTIAL OILS MIXTURE

Oil of Cloves	5 minims
Oil of Cajuput	5 minims
Oil of Juniper	5 minims
Aromatic Sulphuric Acid	15 minims
Spirit of Ether	30 minims

One drachm doses in an ounce of water every half hour, but not more than 8 doses to be given.

In bad cases of cholera the mixture may be given every 15 minutes in half drachm doses in water.

PILLS

62. CALOMEL, COLOCYNTH, AND HYOSCYAMUS PILL

Calomel	1½ grains
Extract of hyoscyamus	1 grain
Compound extract of colocynth	2½ grains

A good purgative pill : one or two at night.

63. OPIUM AND ASAFÆTIDA PILL

Opium in fine powder	1 grain
Red pepper	1 grain
Asafætida	2 grains

Has been called a 'cholera pill.' Should only be used in earliest stages and if the diarrhoea is not very severe. Never give it once rice-water stools are passed.

64. NUX VOMICA AND BELLADONNA PILL

Alcoholic extract of belladonna	¼ grain
Extract of nux vomica	¼ grain
Extract of aloes	1 grain

Used in constipation due to lack of muscular power in the bowel : one or two at night.

65. RHUBARB AND MERCURY PILL

Mercury pill	2½ grains
Compound rhubarb pill	2½ grains

A good purgative pill : is very kind. One or two at night.

POWDERS.

66. COMPOUND BISMUTH POWDER

Calcium Phosphate (tri-basic)	} Equal parts.
Bismuth Carbonate	.	.	.	.
Heavy Magnesium Carbonate	.	.	.	.

One teaspoonful in a little water to be taken after meals or when the pain is severe.

67. COMPOUND CALOMEL POWDER

Calomel	.	.	.	.	.	.	.	1	grain
Camphor	.	.	.	.	.	.	.	1	grain
Sodium bicarbonate	.	.	.	.	.	.	.	2	grains

68. COMPOUND BORIC POWDER

Powdered camphor	.	.	.	.	.	.	.	10	grains
Boric acid	.	.	.	.	.	.	.	2	drachms
Zinc oxide	.	.	.	.	.	.	.	2	drachms
Starch	.	.	.	.	.	.	.	4	drachms

As a dusting powder.

Very useful in prickly heat, to prevent bed-sores, or in other irritative conditions.

69. COMPOUND STRAMONIUM POWDER

Powdered dhatura leaves	.	.	.	.	.	.	.	1	ounce
Powdered anise fruit	.	.	.	.	.	.	.	1	ounce
Potassium nitrate	.	.	.	.	.	.	.	1	ounce
Powdered tobacco leaves	.	.	.	.	.	.	.	30	grains

10 to 30 grains to be ignited on a plate and the fumes inhaled.

As a sedative during an asthmatic attack.

70. KALADANA POWDER

Black seed (Kaladana) in fine powder	.	.	.	.	.	.	.	1	drachm
Powdered ginger	.	.	.	.	.	.	.	10	grains

A purgative pill : ingredients obtained cheaply in any Indian bazar.

71. TOOTH POWDER

Light magnesium carbonate	.	.	.	.	.	.	.	2	drachms
Borax	.	.	.	.	.	.	.	2	drachms
Oil of cinnamon	.	.	.	.	.	.	.	5	minims
Precipitated chalk	.	.	.	.	.	.	.	1	ounce

A cheap and efficient tooth-powder.

PREPARATIONS FOR CHILDREN

The doses are calculated for an infant of twelve months unless otherwise stated. To calculate the dose for other ages, *see* p. 6.

MIXTURES

Besides those here named the following mixtures included in the preparations for adults are suitable for children in doses proportional to 1 drachm thrice daily for infants of twelve months :

Bismuth mixture.

Chalk mixture.

Castor oil emulsion.

Iron and magnesium sulphate mixture.

The dose of each mixture is 1 drachm.

72. BABY'S LINCTUS

Compound tincture of camphor	2½ minims
Ipecacuanha wine	2½ minims
Glycerine	20 minims
Peppermint water to	1 drachm

For an irritating cough. Do not give in severe bronchitis or in broncho-pneumonia, except under medical advice.

73. FERROUS IODIDE MIXTURE

Solution of ferrous iodide (strength 1 in 10)	20 minims
Extract of malt	40 minims
Chloroform	½ minim
Each drachm of this mixture contains 2 grains of ferrous iodide.	

A good children's tonic, especially for tuberculous children. For glands in the neck or abdomen or in convalescence from wasting diseases.

74. INFANTS' BISMUTH MIXTURE

Bismuth carbonate	5 grains
Sodium bicarbonate	1½ grains
Spirit of chloroform	1 minim
Powdered tragacanth	½ grain
Water to	1 drachm

Used in the green 'summer' diarrhoea of infants ; or for vomiting. A gastric and intestinal sedative. Will colour the motions black.

75. INFANTS' IPECACUANHA MIXTURE

Ammonium carbonate	½ grain
Ipecacuanha wine	3 minims
Golden syrup	8 minims
Water to	1 drachm

A cough mixture for children. Useful in bronchitis.

76. INFANTS' IRON MIXTURE

Iron and Ammonium Citrate	5 grains
Chloroform water to	1 drachm
1 to 2 drachms three times a day for anæmic infants and young children.	

77. CHILD'S LAXATIVE MIXTURE

Liquid Extract of Cascara	} 15 minims
Liquid Extract of Liquorice	
Aromatic Spirits of Ammonia	7 minims
Syrup of Orange	30 minims
Chloroform water to	2 drachms
Half to two drachms at bed time.	

78. PHOSPHATE SYRUP

Syrup of ferrous phosphate	$\frac{1}{2}$ drachm
Calcium hypophosphite	1 grain
Syrup to	1 drachm

A good child's tonic. Useful in rickets also.

79. INFANTS' SULPHATE AND CARBONATE MIXTURE.

Sodium Sulphate	15 grains
Sodium Bicarbonate	10 grains
Magnesium Carbonate	3 grains
Glycerine	10 minims
Distilled water	2 drachms

Two teaspoonfuls every three hours to an infant of one year until the stools become watery and blood and mucus disappear.

POWDERS FOR CHILDREN**80. COMPOUND SANTONIN POWDER**

Santonin	2 grains
Compound scammony powder	2 grains

Suitable for a child of four years.

For round and thread worms.

81. INFANTS' MERCURY POWDER

Compound rhubarb powder	2 grains
Mercury with chalk	$\frac{1}{2}$ grain

Useful in some intestinal troubles of children ; sometimes during teething ; and often for constipation.

ointments for general use

82. BORIC OINTMENT

Boric acid	1 drachm
Soft paraffin	1 ounce

A mild antiseptic ointment : generally useful.

83. CHRYSAROBIN OINTMENT

Chrysarobin	20 grains
Simple ointment	1 ounce

For psoriasis, and ringworm, as Dhobi's itch. Do not allow it to reach tender parts as the face, or scalp, especially not the eyes, as it is very irritant. It will permanently discolour clothes. If too strong, dilute with vaseline.

84. RED IODIDE OF MERCURY OINTMENT

Red mercuric iodide	1 drachm
Simple ointment	9 drachms
Mix. To be freshly prepared.	

A strong counter-irritant ointment : for use over an enlarged spleen or a goitre.

85. WHITE PRECIPITATE OINTMENT

Official : Unguentum Hydrargyri ammoniati

Ammoniated Mercury	1 part
White Paraffin Ointment	9 parts

86. SIMPLE OINTMENT.

Hard and soft paraffin in proportion according to the temperature prevailing.

As a basis for medicaments, or as a simple salve by itself.

87. SULPHURIC OINTMENT

Sublimed sulphur	1 part
Simple ointment	9 parts

For parasitic skin diseases, as scabies (the itch).

88. COMPOUND ZINC OINTMENT

Oxide of zinc	15 grains
Calamine	15 grains
Simple ointment	1 ounce

A sedative ointment ; for chapped hands, eczema, &c.

PREPARATIONS FOR THE EYE

89. ZINC DROPS

Sulphate of zinc	.	.	.	.	.	.	$\frac{1}{2}$ grain
Distilled water	.	.	.	.	.	.	1 ounce

An astringent lotion useful in mild ophthalmia and watery eye.

90.

Sulphate of zinc	.	.	.	.	.	.	1 grain
Distilled water	.	.	.	.	.	.	1 ounce

Similar to 89, but stronger.

91.

Sulphate of zinc	.	.	.	.	.	.	2 grains
Distilled water	.	.	.	.	.	.	1 ounce

Similar to 89, but stronger. Used in angular conjunctivitis.

92.

Blue pill	4 grains each
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Use preferably those sold by Burroughs Wellcome & Co. in uncoated tablet form. Useful internally in iritis.

(Should be well chewed up.)

93. BORACIC LOTION

Boracic acid	.	.	.	.	.	.	10 grains
Distilled water	.	.	.	.	.	.	1 ounce

Useful in many diseases of the eye, such as simple ophthalmia, corneal ulcer, &c.

94. LEAD AND OPIUM LOTION

Strong solution of subacetate of lead	.	.	.	.	.	.	6 minims
Liquid Extract of Opium	.	.	.	.	.	.	$\frac{1}{2}$ drachm
Distilled water	.	.	.	.	.	.	1 ounce

A useful soothing lotion for swollen eyes due to mosquito bites

95. YELLOW OXIDE OF MERCURY OINTMENT

Yellow Oxide of Mercury 1% or 2% put up in tubes by Parke Davis & Co. Locally prepared ointment is apt to be unreliable.

96. EYE BATH

This can be obtained at any chemist, and as well as being useful for applying lotions to the eyes, it may be used as a routine in dusty weather.

97. ESERINE DROPS

Physostigmine (Eserine)	. . . . .	4 grains
Distilled water	. . . . .	1 ounce,

98. NITRATE OF SILVER DROPS

Silver Nitrate	. . . . .	5 grains
Distilled water	. . . . .	1 ounce

99. HOMATROPINE OINTMENT

Homatropine	. . . . .	2 grains
Oleic Acid	. . . . .	40 grains
Soft Paraffin	. . . . .	1 ounce

Used in Iritis and ulcers of the Cornea.

100. PANTOCAINE DROPS

Pantocaine	. . . . .	4 grains
Distilled water	. . . . .	1 ounce

101. MAGNESIUM SULPHATE LOTION

Magnesium Sulphate	. . . . .	1 ounce
Distilled water or water that has been sterilised by boiling	. . . . .	1 pint

A useful and safe eyewash in any affection of the eye.

102. CHLORETONE OINTMENT

Chloretone	10 grains
Soft Paraffin	1 ounce

103. ARGYROL LOTION

Argyrol Lotion	5 %
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